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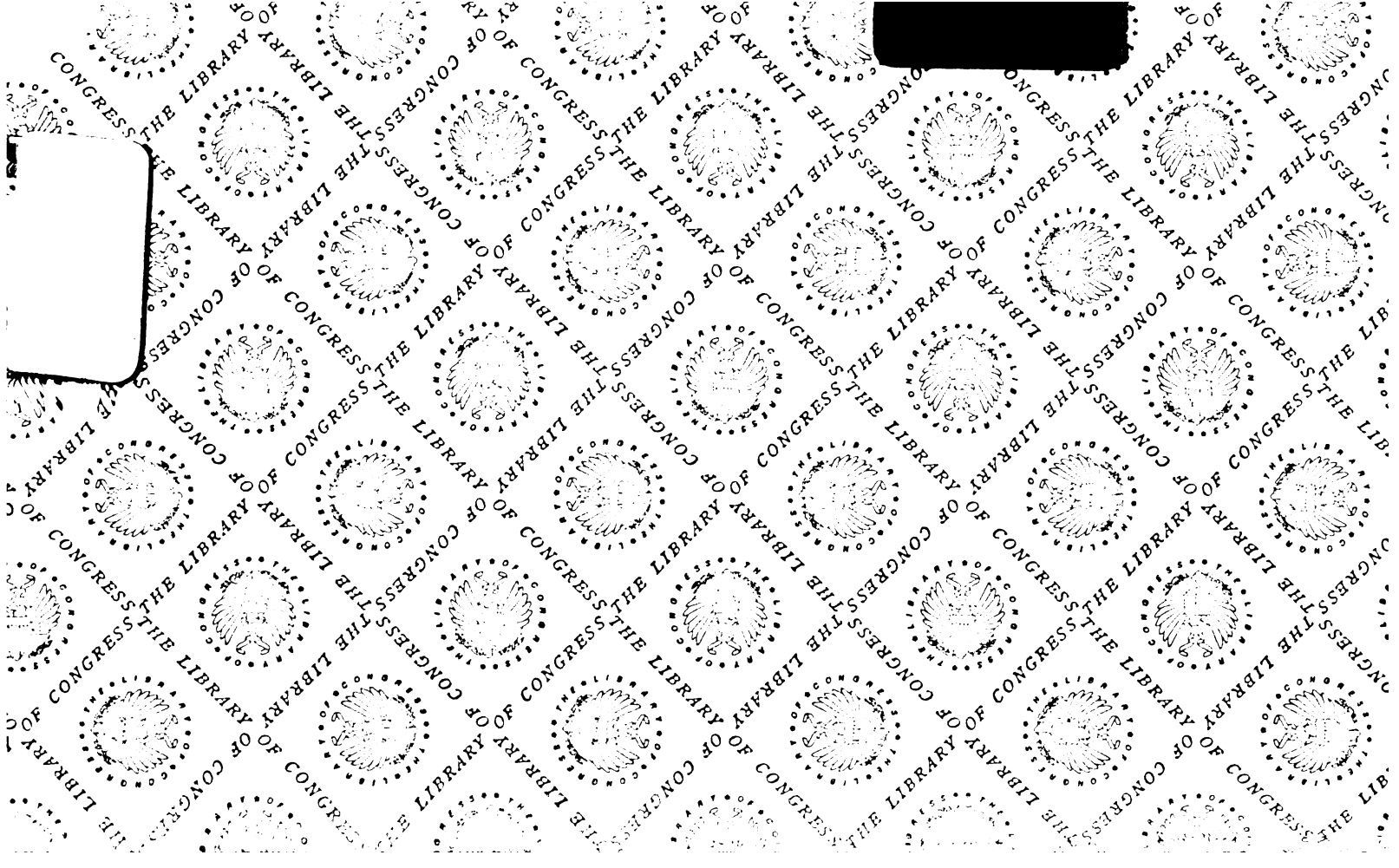
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UNITED STATES STEEL CORPORATION

HEARINGS

BEFORE THE

COMMITTEE ON INVESTIGATION OF UNITED STATES STEEL CORPORATION

HOUSE OF REPRESENTATIVES

(IN EIGHT VOLUMES)

VOL. 5

HEARINGS NOS. 50-53

(Includes Part I of Hearing No. 53)

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WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

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No. 50

UNITED STATES STEEL CORPORATION

HEARINGS

539
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BEFORE THE

COMMITTEE ON INVESTIGATION OF UNITED STATES STEEL CORPORATION

U.S. HOUSE OF REPRESENTATIVES

WEDNESDAY, FEBRUARY 14, 1912

WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

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UNITED STATES STEEL CORPORATION.

COMMITTEE ON INVESTIGATION OF THE
UNITED STATES STEEL CORPORATION,
HOUSE OF REPRESENTATIVES,
Washington, D. C., Wednesday, February 14, 1912.

The committee this day met, Hon. Augustus O. Stanley (chairman) presiding.

STATEMENT OF MR. PERCIVAL ROBERTS, JR.

Mr. Roberts was duly sworn by the chairman.

The CHAIRMAN. I understand, Mr. Roberts, that you desire to make a statement touching the labor conditions in the United States Steel Corporation; and the committee will be very glad to hear from you.

Mr. ROBERTS. Mr. Chairman, it has seemed advisable, apparently, from some testimony which has recently been given before the committee, that the corporation should present its side of the case, and as a director of that corporation, I have been asked to tell you what I know of it.

I regret very much that I have had little experience in public speaking, and my statement may, therefore, be much more disjointed than it otherwise would be. If later on, however, there are any questions which any members of the committee wish to ask me, I shall be very glad indeed to answer them in detail.

The CHAIRMAN. You prefer, then, I assume, to make your statement at the present time without being interrupted?

Mr. ROBERTS. I should think that would be best, Mr. Chairman, if it is agreeable to the committee. Then I can answer, in detail, any questions which may arise.

The CHAIRMAN. Very well. Proceed.

Mr. ROBERTS. That you may have some judgment as to the value of any testimony that I may give, I might say that I entered what was then an iron works at the age of 19, in the year 1876; that I commenced as an office boy, and worked through the various departments of the works, afterwards becoming general manager and later president of the company.

I have boarded in the families of iron workers. I have kept house as a bachelor in a four-room workman's house, among Polanders and people of other nationalities, until the year 1900.

Up to that time I probably might say that I was daily in direct contact with the workmen in the works; and after the year 1900, of course, I have not been so closely identified with them.

My knowledge since that time has come largely through reports, statistics, from the men in direct charge of the works.

I entered the board of the Steel Corporation upon its formation in 1901, and resigned in 1902.

I was invited to again enter the board in 1909, and since that date I have been a member of the board, and for a part of that time, a member of the finance committee.

To return to my subject, I have no apology whatever to make for the United States Steel Corporation in regard to its relations with its employees.

I think I can say, briefly, and challenge any proof to the contrary, that the Steel Corporation has done more to ameliorate and improve and maintain the wages of its employees than the entire combined efforts of all employers in the iron and steel trade during the entire nineteenth century.

In addition to that, I would say that, since the organization of the Steel Corporation, they have done more in that respect than the combined efforts of all their competitors.

I would also like to call attention to the fact, which it seems to me the public might have an erroneous impression upon from testimony given here, that the Steel Corporation did not originate the steel industry. It took it as it found it; and in no respect has it reduced wages since that time; in no respect has it increased the onerous conditions of its workmen, but, in all directions, if you will follow in detail the operations in the works, it has improved conditions over and above what they were prior to its organization.

We must clearly distinguish between the policies of the Steel Corporation and the execution of those policies in the various works. With the large number of operations which they control, the various plants, you will find that, while the Corporation may inaugurate a general policy, it will not necessarily and can not be carried out with uniform quickness or uniform fulfillment of that policy throughout the various subsidiary companies, due largely to organization, geographical location, whether the plants are balanced properly; so that these new policies may be put in place.

It is very much like a man who lives in the country and may have three or four horses in his stable, and wants to go to town, and one of those horses may take him there in half an hour, and another one may take him there in an hour; they are all good horses; and the management of these subsidiary companies, while they may be all good managements, will not, in all cases, show regularity in carrying out the policies of the corporation.

Briefly, first, to illustrate the various operations of these subsidiary companies, I think we might classify their activities under three general main classes:

First, mining; second, transportation; third, manufacturing.

Again the mining may be subdivided into three subdivisions:

First, mining of ore; second, mining of coal, with its allied coke industry; third, the mining of limestones.

Coming to transportation, it is of two classes, by land or water.

Third, in regard to the manufacturing, which is probably the most important part from the standpoint of the committee, we have again three subdivisions:

The first subdivision would include those processes which, by their nature, are necessarily continuous, such as the making of pig iron in the blast furnace.

The next subdivision would be that of a more or less continuous process, which would be illustrated by either the open-hearth or the Bessemer process of making steel ingots.

Third. Those operations which are not necessarily in themselves continuous, but are rendered more or less so, due to the continuous nature of the prior pocesses upon which they depend.

Each of these different characters of work must be treated independently. What may be satisfactory in one of them is not necessarily satisfactory in another, and if we go back you will find for many years prior to 1900 workmen working side by side in these various mills, some making 8 hours, some making 9 hours, some making 10 hours, some making 12 hours, perfectly in harmony.

I might also say in this regard that my experience has always been that while it was extremely easy and without any difficulty at all to turn a 10-hour or an 8-hour position into a 12-hour position it was impossible to get a 12-hour man to go back to a 10-hour position.

The CHAIRMAN. What do you mean by that, Mr. Roberts?

Mr. ROBERTS. I mean this: That a man preferred the 12-hour position to the 10-hour position. Necessarily, it gave him more pay.

But, even with that, he considered that his conditions were improved. As a rule the 12-hour position was under cover, whereas the 10-hour position would be out of doors.

I have seen in times of depression, when the works were not fully employed, 12-hour men rather lay off than take a 10-hour position.

The CHAIRMAN. I do not want to interrupt you, Mr. Roberts, but I may be laboring under a misapprehension, and I want to ask you about this.

I shall have the report of Commissioner Neill here in a few moments; and I find in his report that, as a class, 12-hour men are paid less than 10-hour men—unless I greatly mistake his statements or have misread them. I have sent for the report.

Mr. ROBERTS. I do not know, of course, to what you may refer; but we can not judge a cow and a bull in the same ring at the same time; and when we refer to 10-hour men and 12-hour men, I would refer to what might be termed "unskilled labor."

Of course, when you come to 12-hour men that are skilled labor, that is another matter.

Then, again, there are 10-hour men that are skilled men; 9-hour men that are skilled men; 8-hour men that are skilled men, also.

Mr. STERLING. And they might get more wages than an 8-hour man that was not a skilled workman.

Mr. ROBERTS. Undoubtedly. But if we are going to compare them, I speak of 10-hour men as the unskilled men; for instance, with the pick and shovel, who are working the 10 hours. It is continuous labor, whereas the 12-hour man, who is an unskilled laborer, and is brought into a 12-hour position, no longer operates as a continuous operation. He is on duty 12 hours, but his work is not continuous. The laborer at 10 hours is a continuous operator. He may be using a pick and shovel, cleaning up, and things like that, and his hours of labor are 10 hours; showing that, on the part of the men, they prefer the 12-hour to the 10-hour occupation.

Also it wants to be borne in mind that while these operations are continuous, and have always necessarily been continuous, it does not

follow that the employee is continuous in his occupation throughout the year.

The blast furnace goes on from day to day, from week to week, from month to month, without cessation until it is worn out and put out of blast. It must be run in that way.

While we talk of these continuous operations, in the past as in the present men have not worked continuously. They have taken time off. They have taken a day off, and probably a great many of them would average a day off in a week. There are always a number of understudies, and men have taken their days of rest.

When I first entered the iron business, steel was practically unknown, except for purposes of railroad rails and tools. The blast furnace was operated 7 days a week, 12 hours a turn. The unit of activity in rolling mills was then the puddling furnace. Those men operated on the night shift, 5 nights a week, 21 hours; and on the day turn they operated 6 days a week, 12 hours; the finishing departments did the same. They were all 12-hour turns.

The introduction of steel extended the continued processes beyond the blast furnace, in making iron. The blast furnace made cold pig-iron, which was transported, possibly, many miles to the puddling mills and finishing mills.

There was no dependence of one upon the other. By the use of steel a continuous process was formed from the melting of the pig-iron until the finished article was produced. Hence all these subsequent processes became more or less dependent upon the running of the blast furnace and continuity of their operations was necessarily increased.

So that we find that, prior to 1900, many of the mills operated not only six days of the week, but the six nights of the week, excepting Saturday night. They would commence Sunday night, and end their work Saturday, at 6 o'clock in the afternoon.

Such was the situation upon the formation of the Steel Corporation.

Very early in the existence of the United States Steel Corporation, even prior to my retirement in 1902, a number of these questions had been discussed, and efforts had been made to develop some improvements. in the conditions of labor.

Those after I retired were continued, and I have with me here, and, with the permission of the committee, I would very much like to submit, certain data and information on that subject.

The CHAIRMAN. At that point, Mr. Roberts, what I referred to a few moments ago, in the report of Commissioner of Labor Neill is this: I find that Commissioner Neill in his report states that more than 56.48 per cent of the 172,706 employees of the steel industry generally earned 16 cents and under 25 cents per hour. In another place, he speaks of the number of men employed in blast furnaces.

I find here in another report, that he speaks of the blast furnace men working 84 hours a week, and on page 25 of the commissioner's report here I find that of the 31,354 blast-furnace employees, 16.29 per cent of those who work 12 hours a day seven days a week earned less than 14 cents an hour, while those who worked in the puddling mills, which I believe is 10-hour work, showed 5.35 per cent earning that sum, and in the rolling mills, 5.74 per cent, and in the tube mills, 3.01 per cent.

Mr. ROBERTS. Mr. Chairman, I hold no brief for the steel industry as a whole. I think those figures bear out the statement which I made a little while ago, namely, that the Steel Corporation, as a corporation, has done more to benefit the conditions of its own employees than the united efforts of all its competitors since its formation.

The CHAIRMAN. Not to interrupt you, I want the chairman to be understood. I have said, gratuitously, and in justice to the Steel Corporation, that I did not consider the Steel Corporation, in the treatment of its employees, was a greater offender than its competitors; nor was I denying that, in many instances, I had found that the rate of pay by the Steel Corporation was in excess of that of its competitors. I was speaking of the conditions generally. There is a slight difference, in Pittsburgh, I understand, of a cent or a cent and a half an hour, or something like that; but the general condition is the same.

Mr. ROBERTS. I think, Mr. Chairman, that if Commissioner Neill had confined those figures to the Steel Corporation only, there would have been a very different result produced. That data gives information for the industry as a whole, which I am not here to-day to defend, of course. I think, however, that that is rather an argument in favor of the position which I took a little while ago, as I said.

The CHAIRMAN. I do not want to interrupt the thread of your argument, but I would like to ask you this question at this point, Do you work these men 12 hours instead of 10 hours because they prefer to work 12 hours? Is that the reason for this 12-hour day?

Mr. ROBERTS. It is largely one of the reasons. In my experience in the past, we discussed, and in some places it was tried, the eight-hour turn—three turns in 24 hours. That is possible. It is especially possible when there is a surplus of labor over and above the requirements or demands of the trade. When trade is active it is not so possible, for the reason that men object to the inconvenient hours at which they are required to come to their work. If, for instance, you will consider that the work will start, say at six a. m., that means that the first turn stops operations at 2 p. m.; the second turn then works from 2 p. m. to 10 p. m., and the third turn must come on duty at 10 p. m., and work until 6 a. m.

The men object to that. They do not like it. They prefer to have what they term a "day" or a "night" turn, so that they can either sleep in the daytime or sleep at night.

That is the men's side of it. From the operating standpoint of a large corporation——

The CHAIRMAN. Before you get to that, what I wanted to get at was this: Whether the reason for this 12-hour day was a desire to please your employees, to accede to their wishes, or whether it proceeded from a metallurgical necessity.

Mr. ROBERTS. There is no metallurgical necessity whatever.

The CHAIRMAN. There is no metallurgical necessity for a 12-hour day?

Mr. ROBERTS. None whatever.

The CHAIRMAN. You have instituted this 12-hour day because your men prefer it?

Mr. ROBERTS. It was a matter of mutual convenience, I should say; a desire on the part of the men, probably, to obtain a greater rate of wages by so doing, and then, as I say, a convenience on the

part of the operators in the direct operations of their mills, due to the inconvenience of the 3-hour turn.

As I was about to say, Mr. Chairman, you must realize——

The CHAIRMAN. I think I understand.

Mr. ROBERTS. I was going to say, Mr. Chairman, if you have several thousand men, there is always a percentage of those men who for some reason or other do not report for work. It is necessary, then, to supply their places with others, who are what you might term extra men, who come out and are prepared to take the places of those who do not report for duty.

When you come to a turn beginning at 10 o'clock at night or 12 o'clock at night, it is almost impossible to find those substitutes. They will not come out. They will not risk coming out. They will say that they do not know whether they will get work or not, and they will not appear.

So that, really, the 12-hour turn develops, I might say, from considerations of mutual convenience on both sides. It is not a necessity.

The CHAIRMAN. As I understand, it was the choice of the men in the first place, and a matter of convenience and economy, not necessity, in the second place; and those two motives, as I understand you, were the guiding and governing incentive, the reasons for the establishment of this 12-hour system?

Mr. ROBERTS. That is, in my experience, as I understand it; yes, Mr. Chairman.

The CHAIRMAN. If there is no metallurgical necessity for it, and if the profitable conduct of this business does not require it, did you ever consider the relation of this 12-hour employment to society and to the family of the workman? It is a matter that interests me very deeply.

Assuming that he is a sober, discreet, industrious man—you have a family, I presume; I have—the presence of the head of his family with his family, to my mind, is in a way necessary. We—you and I and all of us, even the man who works 12 hours a day—should provide something more for his wife and children than raiment and sustenance. A man's presence in the house, his personal supervision of the education, the moral training of his children, from the view point of a legislator, who is a conservator not only of the law, but of the welfare of society, is necessary.

I fancy that a man working 12 hours a day, out of which time must come his time for eating his breakfast and supper and all that, would have little or no time, except for sleep, in the bosom of his family. He would have but little time for the care and rearing of his children. Did that phase of this industrial problem ever occur to the directors of the United Steel Corporation?

Mr. ROBERTS. Mr. Chairman, we have not reached Utopia in this country yet, or in any other country.

If we go into an academic discussion of those matters we are opening up a very wide field, a field which even extends far beyond the operations of the United States Steel Corporation or even the steel industry of this country.

The CHAIRMAN. This is not an academic proposition, Mr. Roberts. It is a practical, existing, vital condition with Congress, for this season:

For instance, in the last naval appropriation bill I introduced several resolutions providing that munitions of war, armor, arma-

ment, plates, and guns, and all that sort of thing, for battleships should only be furnished to the Government under certain conditions; and that provision was incorporated into the law.

There is another resolution that has been introduced by Mr. Hughes, that there should be an eight-hour day in those establishments, and that men should only be required to work eight hours a day to produce them.

This Government is not regarding this as an academic proposition, but is regarding it as a vital matter, as a public necessity, or at least, as a wise public provision, and refuses to work men upon any of its public buildings more than eight hours a day, even though the man wants to work longer. Upon this structure here no man was allowed to work more than eight hours, even though he applied for the privilege. So that this is a condition and the reason for that provision was not that the Government was indifferent to the wishes of the wage earner, but that we regard it as more important than saving the Government money, more important than the wishes of the employer, more important than any of the reasons you have given as governing the United States Steel Corporation, that a man should have the opportunity, if he were so disposed, to give some part of his waking hours to the training as well as to the mere sustenance of his family.

Mr. ROBERTS. Do I understand, Mr. Chairman, that you are now discussing the general question of hours of labor?

The CHAIRMAN. Yes.

Mr. ROBERTS. That extends, of course, far beyond the confines of the operations of the United States Steel Corporation. I understand that that would extend to all trades and activities, no matter of what character.

The CHAIRMAN. Yes.

Mr. ROBERTS. For instance, to agriculture, where probably the hours of labor are longer than in any other occupation in the country to-day.

The CHAIRMAN. Yes.

Mr. ROBERTS. It would extend to various other activities where the 24 hours are divided into two turns; and they are numberless. I might mention them, but doubtless it is unnecessary.

I think, however, we are going into a theory, if we go into that, as distinguished from a condition.

I say that the 12-hour turn has always been in existence in the steel industry; that it is not a new development due to the organization of the Steel Corporation; the Steel Corporation found it there, and the Steel Corporation has not added to the burden of its men, but, with what statistics I have here, I think I shall be able to show you that they have ameliorated those conditions to a considerable extent.

The CHAIRMAN. I may be mistaken, but I am under the impression that at one time you had an 8-hour day in the Homestead mills, and that at one time Mr. Carnegie wrote a letter in defense of it; and I read into the record here a long statement here from Capt. Jones, whom you knew probably, defending that 8-hour day, and giving some reasons in a much better way than I have done for the 8-hour day.

Mr. ROBERTS. Mr. Chairman, there are to-day some positions in the works where an 8-hour turn is still used.

The CHAIRMAN. Am I right in the idea that the Homestead Co. at one time did have a universal 8-hour day?

Mr. ROBERTS. I am not prepared to say that whether to a greater or lesser degree they may have had it. For instance, they have an 8-hour day in some departments still. In the Bessemer department, for instance, there are three turns of eight hours. I think in their axle forge their hammers are run on an 8-hour turn, simply because the labor in those departments is more continuous and more strenuous than in others. But this whole question of the number of hours of employment is one that, it seems to me, goes far beyond the present investigation.

The CHAIRMAN. That may be.

Mr. ROBERTS. I think we can discuss and argue on that for a long time. Who shall say that eight hours is the proper limit? For instance, in my experience, before the year 1900 I established and offered to my men working in the structural department of our works a 9-hour day instead of a 10-hour day. They came back and said they did not want the 9-hour day; that they would like the 10-hour day, but they would like to have a half holiday on Saturday.

Who shall say that 8 hours is the proper time? We may establish an 8-hour day, and somebody will say that it ought to be 7 hours. There is no doubt that the minimum number of hours is the pleasantest; but, in the economics of this world, how shall we determine what that limit may be? We may do it arbitrarily, by legislation, but even in doing that we shall come up against a problem as to whether even with legislation our legislation will provide food as well as the number of hours that the men shall work.

I do not know. I think that one man in a certain occupation can work 12 hours alongside of another man who is working 10 hours. My experience is that I have seen no ill effects from that 12-hour labor. I must confess I see no worse effects on the part of the 12-hour men than I have seen among the 10-hour men.

In other words, those men that work 10 hours a day I do not think have any brighter, happier homes than the men who work 12 hours a day; not a particle.

You may take extreme instances in both cases and you may present very sad results, undoubtedly, but then, you can find just the contrary. Human nature varies very much in that respect.

I have been in one house of a workman obtaining the same wage as another and that house would be so clean that you could eat off the floor, and the other house would be in such a filthy condition that you did not feel like going into it. Why is that? The wage conditions are exactly the same.

The CHAIRMAN. Oh, of course, you will find individual instances of that kind.

What would you think of a 14-hour day?

Mr. ROBERTS. It is very difficult to say, sir. I should say 14 hours is somewhat too long a stretch.

The CHAIRMAN. I do not desire to enter into an academic discussion. What I want to get at is the facts.

You spoke of the unwisdom of Congress prescribing the number of hours of labor. That would be somewhat revolutionary, I presume. You so regard it?

Mr. ROBERTS. I do not think I used the term "unwisdom," sir.

The CHAIRMAN. Well, that it would be impracticable?

Mr. ROBERTS. No.

The CHAIRMAN. What do you think about the propriety of having Congress fix the number of hours for men to labor in industrial pursuits?

Mr. ROBERTS. I am not, in the first place, prepared to say that it would be constitutional, Mr. Chairman, beyond a certain point.

The CHAIRMAN. I am not. I agree with you.

Mr. ROBERTS. But where they were acting within their rights, I see no reason why they should not do it. The results would have to speak for themselves.

The CHAIRMAN. What do you think would be the result?

Mr. ROBERTS. We have no Chinese wall around this country. We are one of the nations of the world, and we are acting in world-wide activities; and whether we can change by legislation the laws of nature is a question that I am very doubtful about.

The CHAIRMAN. The 12-hour day is not a natural law, is it? The 12-hour day, seven days in the week; do you think that is a natural law, ordained by God or nature?

Mr. ROBERTS. It is a law of nature that men must subsist. What brings these men to this country is that they expect to find better conditions than those under which they have existed in the countries they are leaving. I see no reason for this immense immigration we are having unless conditions in this country are better than those which they leave at home.

The CHAIRMAN. From whence comes this immense immigration?

Mr. ROBERTS. At the present day largely from southeastern Europe and Italy.

The CHAIRMAN. And Roumania?

Mr. ROBERTS. All those countries.

The CHAIRMAN. And from the Balkan States?

Mr. ROBERTS. From Austria-Hungary, Poland, Russia——

The CHAIRMAN. And southern Italy?

Mr. ROBERTS. And southern Italy.

The CHAIRMAN. How do these States compare as to intelligence, morality, the recognition of the Christian God, and in prosperity with Germany, France, England, Ireland, Scotland, Wales, Norway, and Sweden?

Mr. REED. Are you not, Mr. Chairman, making the mistake of crediting Mr. Roberts with the omniscience you found in Mr. Brandeis? I think it is a little away from the topic on which Mr. Roberts wished to speak, if I may be permitted to suggest it.

The CHAIRMAN. The minutes show that Mr. Gayley said that Mr. Roberts is a great expert, and I believe he is. Surely Mr. Roberts knows something of the countries from which these people come who have worked by thousands in his mills?

Mr. YOUNG. He is an expert on what, Mr. Chairman? What was that testimony? I do not remember it.

The CHAIRMAN. An expert "on all departments of the iron and steel manufacture;" page 107 of volume 3 of the hearings.

Mr. YOUNG. The conditions of these men in Europe would hardly seem to be included in that.

The CHAIRMAN. I simply asked that question. If he does not know, he can tell me so. It will do no harm for me to ask him. I can never find out anything if I do not ask.

Mr. STERLING. Do many Germans and Swedes come in now?

Mr. ROBERTS. I do not think they come in as large numbers as they did formerly. At one time there was a large immigration of Swedes into the central West and the Northwest. They went largely into largely into agriculture. Not a great many Swedes have gone into the steel industry. I have had some very good ones, but not in large numbers, although I think about perhaps in the eighties there were some. There were more than at the present time.

You will find even among the immigration from southeastern Europe and Italy there are two distinct classes of people, one who seem to have come here with the intention of becoming citizens of this country, and another who are largely single men, or who come as single men, leaving their families behind, with apparently no intention of remaining in the country. Those are the people among whom you find these inferior conditions.

I have seen Polanders, Italians, Hungarians, Austrians, who come here intending to become citizens. They do become citizens. Their children go to school. They are extremely intelligent. Those people live respectably on exactly the same wage as you find these other people receive who live under conditions which have been testified to here recently. There are two distinct classes. The same thing is true of other races. You may find a very tidy Irish family, and another one living with the pigs in the same room.

The CHAIRMAN. You speak of a long and intimate experience among those laborers. In your opinion, what amount of money to-day is necessary for a man, say, and his wife and three children, occupying a three-room house, to supply themselves and have meat twice a day, and clothe that family decently and keep those children in school?

Mr. ROBERTS. That question I do not consider that I can answer. I can only say——

The CHAIRMAN. Could he do it on less than $2 a day?

Mr. ROBERTS. I would have no answer on that, whatever. Of course, in the first place you might raise the question, is meat necessary twice a day?

The CHAIRMAN. No, it is not; but a fellow likes to have it if he works hard.

Mr. ROBERTS. Opinions differ on that question. We have a good many vegetarians who think it is better not to have any meat at all.

The CHAIRMAN. In the German army, where they get 15 or 20 cents a day, they have invented a capsule that contains the proteids in great strength; it can be made from the hides of dead animals, the heels, the feet of beeves, and such offal from slaughterhouses, as well as from good meat; and they take this capsule and put it in a soup made of rye and barley, and it sustains life very well. Outside of the merely fantastical and whimsical notions that people have of eating meat because it is pleasant, a man might probably subsist just as well that way as any other; but I fancy that would be objectionable on account of certain idiosyncrasies of the palate. Laboring men like meat twice a day, if they can get it. For that reason I predicated the question on meat twice a day. I do not mean to say that

a man can not subsist without any meat at all. They do it in the Balkan States, as you know; these Italians, Poles, people from southern Italy and Roumania, and Syrians that come over here are not in the habit of having meat twice a day. That is what we call here in the House—and we often talk about it—the American style or standard of living for the laboring men.

I want to know if that plan that we hear so much about in the House, and so little about in the factory, could be maintained on less than $2 a day.

Mr. ROBERTS. Bear in mind, also, Mr. Chairman, that the English laborer at home does not have fresh meat probably once a week.

Mr. STERLING. Do you know to what extent the workmen in your company use meat?

Mr. ROBERTS. I do not know. I could not answer that question. I think, however, that you would probably find that they had meat very nearly once a day A great many of these European races, however, are not meat eaters. They do not care for meat. The Italian does not want meat. He wants macaroni, greens, and things of that sort. If they have the privilege of eating meat, they will not use it. They prefer the other kinds of food. They have grown up with those tastes. They do not know what meat is. I do not consider that meat, in itself, fresh meat, is essential to a diet.

Mr STERLING. Before leaving this question of the eight-hour day, have you ever considered as to what day is the best in order to produce the most? I have heard it stated and argued that in many callings, in many lines of work, taking it over a long period of time, men can accomplish more and produce more in eight hours a day than they can where they labor a greater number of hours. Have you ever given that question any consideration?

Mr. ROBERTS. I think it depends very much upon the character of the occupation, Mr. Sterling.

Mr. STERLING. I think that is true in any case.

Mr. ROBERTS. Where it is a concentrated occupation. But, for instance, take a man who is an engineer, attending an engine, who simply remains while the engine is running properly; he is really without employment; he simply remains on duty in case anything occurs. On the other hand, in the case of a man that is occupied at some concentrated work, involving not only the hand but the mind as well, I believe much better results can be obtained by the shorter day.

Mr. STERLING. Take a carpenter, for instance, who goes out and builds a house, or who works in a carpenter shop, or a painter. Consider that class of men. I have heard it said, that they could do more, taking it over a number of years, by having an eight-hour day six days in the week, than they could with a longer day.

Mr. ROBERTS. I think that is quite true, sir. I think there you have the continuous operation. In the case of a carpenter, a bricklayer, and those men who are working at manual labor, so to speak, with the hands, a shortened day, within reasonable limits, does not reduce the output very materially. I think there are some advantages in it.

Mr. GARDNER. Would you include carpenters with painters and bricklayers in that statement? What I mean to say, is this: it has always seemed to me that there was a great deal more diversity to the carpenter's occupation than to that of painters and bricklayers.

Mr. ROBERTS. There is, Mr. Gardner; but, at the same time, it is a continuous operation, by hand, with what you might term tools, operated not by steam or electricity but by hand power.

Mr. GARDNER. There has always seemed to me to be a difference between the kind of work that the carpenter does who works out of doors and the kind of work done by a carpenter who works in a car shop, for example.

Mr. ROBERTS. There is a difference, again.

Mr. GARDNER. I have noticed a very great difference.

Mr. ROBERTS. One is machine work and the other is skilled hand work.

The CHAIRMAN. As to these vegetarian proclivities of the Italian, the Slav, the Roumanian, the Servian, which distinguishes him in his tastes from the American citizen, does that account in any way for the exodus of the American citizen from the steel industry in the last 10 or 15 years, and the influx of these people into that business, more especially than other businesses?

Mr. ROBERTS. No, Mr. Chairman; the increased activity and enlargement of the industries of this country during the past 15 or 20 years has been so great that the increase in the American population has not kept pace with it. We have Americans in the steel industry still; just as originally, you found that Americans were doing more unskilled work in all industries; as the industries developed, they took higher and more skilled positions. They are quicker to adapt themselves than any other nation of workers to their surroundings, and they take the better paid places. Just the same as in railroad building; my first experiences in railroading were that our construction gangs were usually all Irishmen. They have given place entirely to other nationalities. You will find all railroad building is now done by the character of immigrants that are working in the steel works. Go on the western roads, and you will find Asiatics doing that work; and in northwestern Canada Chinamen and Japanese. It is a question of supply and demand, entirely.

It is extremely difficult to establish one uniform rule as to hours of labor, when conditions are so different.

As I was going on to say, side by side in the steel works you will find 8-hour men, 9-hour men, 10-hour men, and 12-hour men, all working in harmony, no one finding fault with his occupation being more burdensome than that of his neighbor; and that condition existed prior to the organization of the United States Steel Corporation. The situation that existed on its formation was that in the continuous operations there were 12-hour turns, and 7 turns a week, so far as the blast furnace was concerned. In the rolling mills there were 12-hour turns, with a few exceptions. The ordinary laborer had 10-hour turns. The rolling mills worked 11 turns per week, and some of them worked 12; which, as I said, was due to the substitution of steel for wrought iron, making those processes necessarily dependent more or less upon the running of the blast furnace.

That is the condition which existed at the time of the formation of the United States Steel Corporation.

The CHAIRMAN. Right at that point, another thing occurs to me, Mr. Gardner, Mr. Roberts was speaking before you came in of blast-furnace conditions, and you were anxious to find out about those?

Mr. GARDNER. Yes. I would like to ask him some questions.

The CHAIRMAN. You may proceed with your questions at any time.

Mr. GARDNER. I will ask you this, Mr. Roberts:

In the first place, take this 12-hour day in your blast furnaces. We have had a good deal of varying evidence before this committee. Some witnesses have said that the men actually work about 4 hours out of the 12, and the other 8 hours they are more or less as you have described the engineer who is doing nothing. Other people have said that 9 hours out of the 12 thay are practically at work. The witnesses have varied, and the reports have varied as to what they do in the time when they are off work—whether they can read the newspapers, whether they have some comfortable place, and so on. Everybody seems to agree that they can not leave the works during those 12 hours.

I would like to have a little elucidation of that situation, as you see it.

How many hours, for instance, do these men who are on duty 12 hours actually work, in the blast furnaces?

Mr. ROBERTS. The discrepancies, I think, in regard to the statements that have been made, Mr. Gardner, largely might be described, as it seems to me, as if some one on a partly cloudy day should observe the amount of time the sun was shining during that day, and thus seek to establish the fact that all partially cloudy days had a certain amount of sunshine. In other words——

Mr. GARDNER. I can understand that the circumstances vary, of course.

Mr. ROBERTS. No two days, in other words, may contain the same degree of labor or the same length of labor, but——

Mr. GARDNER. I can understand that perfectly well; but there must be some meteorological way of ascertaining the percentage of clouds.

Mr. ROBERTS. In the first place, what would you determine to be labor? That is, there are varying degrees of labor. A man part of the time may be working with his brain, he may be performing hard manual labor with his hands; he may be performing very light manual labor with his hands; it is varying so much in degrees. I should say, however, as to those men occupied in those positions around the blast furnaces, no two of them would perform the same periods of labor in a day. If you strike an average, you might take an average of 50 or 60 per cent of their time as occupied, as a whole; but one man might be occupied 80, another 70, another 60, and so on.

Mr. GARDNER. What I wanted was the general average..

Mr. ROBERTS. I do not think these men around the blast furnaces would work more than 9 hours out of 12. Somebody else may say: "That is not work. That man is not doing anything."

Mr. GARDNER. In your opinion a man is working 9 hours out of 12, in one form or another?

Mr. ROBERTS. I should say yes. That is my guess.

Mr. GARDNER. Either at hard or light work.

The CHAIRMAN. What does he do?

Mr. ROBERTS. Each man does something different; the men that tap the furnace, the men that pick up the bars, the men that tend the beds, the filler of the furnace, who sees that the barrels are fetched to the top of the furnace, with ore, coke, and limestone. No two of those men are engaged in exactly the same work, excepting in a few

instances, when they are termed helpers, and such things as that. The work is not continuous. You have a spell of work, and then they stop, and then another spell, and another stop.

Mr. GARDNER. You have estimated that they are required to work 9 hours out of the 12?

Mr. ROBERTS. Of all kinds, yes.

Mr. GARDNER. During the time that they are not at work but are on duty, what may they do? May they go to sleep?

Mr. ROBERTS. Anything.

Mr. GARDNER. May they go to sleep?

Mr. ROBERTS. Anything.

Mr. GARDNER. May they read?

Mr. ROBERTS. Anything.

Mr. GARDNER. Are there any places where they have light to read by?

Mr. ROBERTS. That depends very much upon the type of furnace; upon how modern the furnace is, and what the facilities are.

Mr. GARDNER. May they eat their dinner?

Mr. ROBERTS. They may do anything they want to. They are there. You might say that, to a large extent, it is like an army defending a city. They may be called on at any moment. That furnace may get into trouble, and the whole number of men may be called instantly to that one spot to protecct it. It may have a break——

Mr. GARDNER. These furnaces are out of doors?

Mr. ROBERTS. No, sir; they are sheltered, with roofs over the casting houses, and so on. They are protected from the weather.

Mr. GARDNER. So that if it is raining——

Mr. ROBERTS. They have protection.

Mr. GARDNER. The men are under cover?

Mr. ROBERTS. Oh, yes.

Mr. GARDNER. But not while they are working?

Mr. ROBERTS. Yes; most of them. Probably some fillers, where they are getting up the raw material, would not be under cover.

Mr. GARDNER. The furnace is out of doors, is it not?

Mr. ROBERTS. No; the furnace itself is protected; all the working space is protected around the furnace. You don't want rain to get into liquid iron.

Mr. GARDNER. It is protected by an open shed?

Mr. ROBERTS. Yes; and by the roof.

Mr. GARDNER. Outside of the blast furnaces, according to the synopsis which Commissioner Neill gave of his investigation of the steel industry, I notice that a considerable part of the men were working the 12-hour turns 7 days. Am I correct in that?

Mr. ROBERTS. You are speaking of the industry as a whole, or of the Steel Corporation?

Mr. GARDNER. The industry as a whole.

Then I will ask you this: Outside of the blast furnaces, are there any men who work 12-hour turns; or, if you choose to put it so, are on duty 12 hours a day for 7 days a week, outside of the blast furnaces?

Mr. ROBERTS. So small a number that it would hardly be countable. I would say that before I complete my testimony I should be

glad if the committee will permit me to put in evidence the exact percentages of 12-hour men working in each individual subsidiary company of the United States Steel Corporation to-day, showing exactly the percentages, the hours of labor, and the number of turns per week.

Mr. GARDNER. And showing the number of men?

Mr. ROBERTS. And showing the number of men.

Mr. GARDNER. As well as the percentage?

Mr. ROBERTS. As well as the percentage.

Mr. GARDNER. I, for one, should like very much to have that.

Mr. STERLING. And the wages?

Mr. ROBERTS. I have not the wages in all instances. I have them in some cases.

Mr. GARDNER. I have no doubt that the Chairman would be glad to have that submitted, as a part of your evidence.

The CHAIRMAN. Oh, yes.

Mr. GARDNER. How about men working 12-hour turns for 6 days a week outside of the blast furnaces?

Mr. ROBERTS. That is the usual custom. That is, the men who are in what are termed the noncontinuous operations, the ordinary day laborers, with pick and shovel, work 10 hours a day.

Mr. GARDNER. How about the noncontinuous operations around the blast furnace.

Mr. ROBERTS. Around the open hearth furnace, or around the finishing mills, the turns are 12 hours.

Mr. GARDNER. I do not understand the terms very well; but after the metal has come out of the furnace, it has some other operations through which it has to pass?

Mr. ROBERTS. Before you came in this morning, Mr. Gardner, in my testimony I divided the manufacturing operations of the steel industry into three distinct classes.

First, the production of pig iron; second, the production of the steel ingots from the pig iron; third, the production of the article in its finished form.

Mr. GARDNER. Yes.

Mr. ROBERTS. Those are three distinct operations.

Mr. GARDNER. Yes.

Mr. ROBERTS. The first one, the making of pig iron, is absolutely continuous, and must necessarily be so. The other two, the bessemer and the open hearth, are more or less necessarily continuous. The final operations of the production of the finished material are not necessarily continuous in themselves, but are rendered continuous by reason of the prior operations in the making of the steel ingots and the pig iron.

Mr. GARDNER. Let me ask you right there: Is the operation of making the pig iron necessarily continuous after the time the pig iron has come out of the furnace? I mean the metal after the furnace is tapped? Must it then be continuous? You could not let it cool first?

Mr. ROBERTS. Absolutely so, for you have partly deoxidized material above what you have tapped, for a height of 50 or 60 feet.

The operation from the time the blast furnace is blown in until it is put out for repairs, must never stop.

Mr. GARDNER. I understand as far as the furnace is concerned. I was speaking of the metal after it came out of the furnace; after it was tapped; as to the handling of that.

Mr. ROBERTS. It is tapped in liquid form and run into what is called a mixer. It never becomes cool.

Mr. GARDNER. It never becomes cool until it is in ingots?

Mr. ROBERTS. Until it is the finished article.

Mr. REED. Until it is a rail.

Mr. ROBERTS. From the time the ore goes into the blast furnace until the rail comes out ready for shipment the material has never been cooled.

The CHAIRMAN. That is true of these plates out of which tin is made?

Mr. ROBERTS. No; that is not an absolutely continuous process, such as is involved in the making of a rail, when you get to the lighter and more highly finished forms.

The rail represents true conservation. We save everything we can, just as the slaughterhouses do in the case of a pig.

Mr. GARDNER. These blast-furnace operations, connected with the making of pig iron, are mostly 12-hour turns, are they, or all of them?

Mr. ROBERTS. They are 12-hour turns.

Mr. GARDNER. All?

Mr. ROBERTS. The blast-furnace operations are 12-hour turns.

Mr. GARDNER. Some being 7 days and some being 6 days in the week?

Mr. ROBERTS. The operation is 12-hour turns and 7 days per week?

Mr. YOUNG. That is the blast furnace?

Mr. ROBERTS. Yes; the blast furnace; but please distinguish that from the fact that the men work 12 hours per turn and 7 days per week. That is another matter. But the operation itself is necessarily an operation containing fourteen 12-hour turns per week. That is the operation.

Mr. GARDNER. Which men actually work 7 days in the week for 12 hours a day?

Mr. ROBERTS. Nobody; practically none. We have reduced the system of work at the blast furnaces so that no man works more than six turns per week.

Mr. GARDNER. Supposing you had, instead of 2 turns of 12 hours, 3 turns of 8 hours; as far as the metallurgical situation is concerned, as far as the operating system is concerned, it would answer as well, would it not?

Mr. ROBERTS. Perfectly, sir.

Mr. GARDNER. It is merely a question of whether this work is——

Mr. ROBERTS (interposing). Whether is is done with three turns or done with two.

Mr. GARDNER. Yes.

Mr. ROBERTS. Three turns in twenty-four hours are not unknown. It is practiced in some parts of England.

Mr. GARDNER. The Edgar Thompson Works had it at one time, did they not?

Mr. ROBERTS. I am not clear about that. I know the Carnegie Works at one time had an eight-hour system in part of their establishment, but that was many years ago.

Mr. GARDNER. They had it at the Edgar Thompson Works, I am pretty sure.

The CHAIRMAN. They had it at Homestead, I am sure.

Mr. GARDNER. I do not think so, Mr. Chairman; although you may be right.

Mr. YOUNG. When does this 12-hour turn begin, for the day shift, and when does it end?

Mr. ROBERTS. I think it is usually from 6 to 6.

Mr. YOUNG. From 6 o'clock to 6 o'clock? And during that time the men eat their dinner?

Mr. ROBERTS. Yes. There is no regular hour for dinner. For instance, with the 10-hour laborers, some establishments take half an hour, some three-quarters of an hour, and some an hour, at the blowing of a whistle.

Mr. YOUNG. Yes.

Mr. GARDNER. But these men take their meals when they see fit.

Mr. YOUNG. And the night shift comes at 6 o'clock at night?

Mr. ROBERTS. Yes; and then the next shift comes on, and then the next. It is a continuous operation.

Mr. GARDNER. I do not fail to realize entirely the difference between a steady occupation, continuing for hours, and an unsteady occupation. I am not so unreasonable as not to recognize that there is a very great difference. But here is a statement quoted from Capt. Jones, whom you knew, I suppose?

Mr. ROBERTS. I knew him quite well.

Mr. GARDNER. This is taken from the bridge history of the Carnegie Steel Corporation, but the evidence appears to be documentary, so that it does not depend upon his statement. (Reading.)

In Capt. Jones's statement of the causes of the great output of the Edgar Thompson's Works, quoted in a previous chapter, he says:

"I soon discovered it was entirely out of the question to expect human flesh and blood to labor incessantly for 12 hours, and therefore it was decided to put on three turns, reducing the hours of labor to 8."

He adds that—

"This proves also to be of immense advantage to both the company and the workmen, the latter now earning more in 8 hours than they formerly did in 12 hours, while the men can work harder constantly for 8 hours, having 16 hours for rest."

That is the end of the quotation, and that is all I want to call your attention to, as I am aware that there is a difference of opinion as to Mr. Bridge's capacity and bias in writing his book.

Mr. ROBERTS. If you will kindly let me say a word in regard to that?

Mr. GARDNER. I would like your comment on that.

Mr. ROBERTS. Capt. Jones lost his life, I think, before the year 1890; possibly earlier than that; so that that statement is somewhat ancient history.

Mr. GARDNER. That is true.

Mr. ROBERTS. The conditions in steel works at that time would probably warrant an 8-hour turn, as compared to a 12-hour turn to-day. It was before the introduction of electricity and was at a time when men had pretty hard positions to fill.

For instance, there is no operation to-day in a steel industry that is comparable with the work of an iron puddler in the past. At the time of which Capt. Jones speaks the mills were equipped so that a man, by the time he had completed an 8-hour turn, had done about

all the manual labor that he could do; just as I say to-day, you will find, in the same works, 8-hour, 9-hour, 10-hour and 12-hour men working in perfect harmony together, due to the laboriousness or the comparative laboriousness of their operations. For instance, a man to-day forging car axles under the hammer, by the time he handles axles for 8 hours it is as much as any man can do, and his turn is finished.

Another man works 9, another man 10 hours in various occupations. Then you come to these 12-hour men, doing the least continuous occupations of all, and whose work is largely a matter of operating push buttons and electric levers.

That is what made possible the 12-hour day. It was the diminution of the laboriousness of labor.

At the time of which Capt. Jones speaks, however, 8 hours was quite equivalent to 12 hours at the present day.

Mr. GARDNER. You mean that the 8-hour work was a great deal more then than 8 hours work would be now in the blast furnaces? It was a great deal more laborious?

Mr. ROBERTS. That refers to your steel works; to your finishing departments.

Mr. GARDNER. Yes; generally.

Mr. ROBERTS. The operations of the blast furnace 20 years ago, where they had 12-hour turns, were far more laborious than the operations of to-day. It was all hand labor. For instance, men filled the cars with material, they were taken to the top of the furnace on a hoist, men pushed them into the top of the furnace, and the pig iron was tapped into the bed, and as soon as it was cool, almost red-hot, men went into that bed and picked the red-hot pigs up by hand, too, and carried them out and deposited them outside. All that work is now done by machinery. Your raw material is handled electrically. No men are at the top of the furnace to push it in. There are no men carrying red-hot pig iron, because it is either run out in a liquid condition and put into the mixer, or else it is put into a casting machine and mechanically carried off and dumped on to cars.

Mr. GARDNER. There are two questions involved in this matter of the 12-hour day. One of them is whether it is too laborious for the men. That is to say whether, by the time a man is 40 or 45 years old, he is like a squeezed sponge, which causes an economic loss to the community, of course.

Then, there is this other question, which has been raised by the chairman: That is, whether 12 hours on duty is too much to take out of a man's day, even if he does not work one hour of it. Do you see what I mean? Those are two entirely different questions—the question of bringing up his children, and so on, and the question of whether he is exhausting himself as a human wage earner, and perhaps exhausting the race in the future.

The question of whether 12 hours is too much to take out of any man's day, from the point of view of his family, depends somewhat upon whether he has a family or not. What proportion of these men working 12 hours a day are married?

Mr. ROBERTS. Taken as a whole, I should say that the majority of them are married.

Mr. GARDNER. The majority?

Mr. ROBERTS. The majority.

The CHAIRMAN. Do the majority of men have families, too?

Mr. ROBERTS. Taken as a whole, I should say yes.

Mr. GARDNER. If it paid better to have an 8-hour day, as far as production is concerned, as some people believe, the companies of themselves would come to an 8-hour day. But the interest of the community is quite different.

For instance, it might pay you to work the men 10 hours a day, and yet the man could not in a lifetime, working for you, do as much as if he worked 8 hours all his life. In other words, he would become a burden on the community, and yet the burden would be felt by the community and not by you, because you would have a new and unexhausted man instead of an exhausted one.

The two questions I wanted to get through my mind were, first, the question of whether the work was too laborious in the 12-hour day; and, second, this sociological question which has been raised by the chairman, and very properly, as to whether or not 12 hours of duty are too much to take a man away from the rest of his life—in other words, whether he should be separated for one-half of his lifetime from other occupations which are voluntary.

Mr. ROBERTS. Answering the first part of your question, Mr. Gardner, which I assume refers to some statements of "old age at 40"——

Mr. GARDNER. No; that was one of the things in my mind. That does not seem to me altogether convincing—that old age at 40.

Mr. ROBERTS. I was going to say that I had some statistics and data here which would show that the sponge at 40 had not been squeezed very hard.

Mr. GARDNER But it seems to me it is possible that, although it might not be at 40, it might be, still, at 48 years of age. I know a man at my age can not do as much physical work, whether I had worked 1 hour or 10 all my life.

Mr. ROBERTS. But in your line, sir, you are as capable as ever, and in their line you will find the same thing true. I can put my finger on a great many men that have been working 30 and 40 years in these works, in all different departments, that are as hale and hearty as they ever were.

I had a man come in to see me not long ago, in my office, and he said he was 80 years old and felt just as fit as ever, and the only thing that he found fault with was that he had been put upon the pension list.

Mr. GARDNER. Was that man working on the 12-hour day?

Mr. ROBERTS. He had been on the 12-hour day all his life. I had known him personally for 25 years.

Mr. GARDNER. You admit that he is probably an exception?

Mr. ROBERTS. That man was a heater, and he had worked in one of the most severe, if not the most severe, occupation there is—in front of the heating furnace all his life.

Mr. REED. Would the committee be interested in having these statements that Mr. Robetrs has prepared?

Mr. GARDNER. I think it would all be very interesting.

I have only one preconceived idea on the subject, and that is that when you find a 12-hour day existing, seven days in a week, there is a presumption which requires very substantial explanation.

Mr. REED. Exactly; I do not think it can be rebutted by single instances.

Mr. GARDNER. I do not, either.

Mr. REED. And so Mr. Roberts has a collection of statistics which will give you the information.

Mr. GARDNER. Any material you place before us would have the same study from me that Mr. Neill's report will receive, as soon as it is available in full shape.

Mr. STERLING. Is this data in printed form?

Mr. REED. No; it is something that Mr. Roberts has prepared for the committee to-day.

Mr. ROBERTS. These are statistics giving the actual condition existing to-day in all of the subsidiary companies of the United States Steel Corporation in regard to the conditions and hours of labor. It is all down in black and white, and I shall be very glad to give it to the committee.

The CHAIRMAN. If you please.

Mr. STERLING. Does it give the wages of the workmen?

Mr. ROBERTS. Yes; it gives the wages of the workmen and the number of hours in which they have been occupied in the week.

The CHAIRMAN. Does it give the nationalities of the workmen?

Mr. ROBERTS. I have some statistics on nationalities in general; yes.

Mr. GARDNER. Does it give the number of children?

Mr. ROBERTS. No.

Mr. GARDNER. Does it show whether these workmen are married or single?

Mr. ROBERTS. I think I have here that information for some of the works.

The CHAIRMAN. I would suggest, Mr. Gardner, instead of dumping these statistics in a mass, that Mr. Roberts take those statistics, one table or statement at a time; for instance, one table showing the wage of the workmen, and let us know to what plants that applies, and for what time, and let us ask him about the table, and become thoroughly advised in regard to that one before going to the next; and then take up the next table, and so on.

Mr. YOUNG. Do not the tables speak for themselves?

Mr. GARDNER. I should like to have a chance to study them.

Mr. ROBERTS. I shall be very glad to present some typical ones, if it meets your approval, and read them, and then if there are any questions which you may want to ask me, you could probably do it better.

Mr. GARDNER. I am willing to start it that way; but unless other people's minds work a great deal quicker than mine it will not be nearly so satisfactory as to have the tables put in and give us an opportunity to study them and hear this witness at some other time on them.

Mr. ROBERTS. I can put them in. There are some figures that will speak for themselves without any explanation. But I am perfectly agreeable to either plan that the committee prefers.

Mr. GARDNER. It is all interesting to me. The only point that I am suggesting is that I know I can not digest a statement as it is laid before me. I should prefer to have time to study the statements before asking questions in regard to them.

Mr. YOUNG. They will all be printed.

Mr. ROBERTS. As I said before you came in, Mr. Gardner, this 12-hour question is pretty broad. It extends not only to the steel in-

dustry, but to agriculture and various other occupations as well. We do know that it has existed in the steel industry for a great many years; that it has been the standard ever since the days of iron.

Mr. GARDNER. I do not want to get into an argument with you, but of course you know that the agricultural employment is scarcely a fair comparison, because of the fact that it is limited so much by the sun's rising and setting and by the seasons of the year, and because agriculture is not a continuous operation like the work in the steel business.

Mr. ROBERTS. But then when you go into those considerations it is to be remembered that the cows have to be milked, whether it is dark or whether the sun is shining.

The CHAIRMAN. The cows in my country do not give milk all day. [Laughter.]

Mr. ROBERTS. The difficulty I have found is in getting men to milk my cows all the year.

Mr. DANFORTH. I move, Mr. Chairman, that we have one of these tables presented before us, and then we can tell whether we can go on with the others or not. We can ask questions on one of the statements.

The CHAIRMAN. All right.

Mr. ROBERTS. Gentlemen, I have this subdivided. I do not know whether I shall take up too much of your time, but if I follow it through in proper sequence I would commence with the mining industry first.

Transportation I did not intend to touch upon, because it is regulated by Government enactments, and it is subject to the same conditions as those prevailing in regard to all other common carriers, so that it does not seem to be necessary to touch on transportation.

I had intended to touch on the conditions existing in the mining industry and on the manufacturing end, including the blast furnaces and steel works.

If agreeable to the committee I would commence with the mining industry.

I have here a letter from the secretary of Mr. Thomas Lynch, president of the H. C. Frick Coke Co., under date of February 8, 1912, addressed to Mr. C. L. Close, committee of safety, United States Steel Corporation, reading as follows:

H. C. FRICK COKE CO.,
Pittsburgh, Pa., February 8, 1912.

DEAR SIR: Your telegram of the 7th to President Lynch regarding 6-day-a-week rule, etc., is received in his absence. We, of course, are unable to say definitely whether or not Mr. Lynch would modify his letter to you under date of October 21 last, but from present conditions think he would not, as the hours of labor have not been changed and the number of day men in the region, working 12-hour shift, six days a week, is, approximately, the same as at the time of the president's letter. Detailed statement shows this to be 2.1 per cent of the total employees on the roll.

Your telegram will be referred to Mr. Lynch on his return to the office Wednesday of next week, and should he desire any change made you will be so advised.

Yours, very truly,

H. SHORT,
Secretary to President.

Mr. C. L. CLOSE,
Committee of Safety United States Steel Corporation,
71 Broadway, New York, N. Y.

That refers to the Connellsville mining operations—coal mining. That shows that the condition existing to-day is the same as when these reports were made.

That letter was from Mr. Lynch's secretary.

Next I have a report from Mr. Lynch to Mr. C. L. Close, secretary committee of safety, United States Steel Corporation, dated October 21, 1911, as follows:

H. C. FRICK COKE CO.,
Pittsburgh, Pa., October 21, 1911.

DEAR SIR: Replying to your inquiry of 20th instant, at no time did we have more than 2 per cent of our working turns of 12 hours each, or working seven days per week. They are made up of firemen, machinists, stationary and hoisting engineers, and pumpers, principally.

We have discontinued the seven days a week entirely, except some monthly men, such as chief machinist, etc., who are on duty more or less of the time seven days a week, but many days have nothing on particular to do.

Therefore, we have no man working by the day who is on duty more than six consecutive days, and we have made no reduction and do not expect to make any reducin the hours of the men who have been working 12-hour turns.

Recently we sent Mr. Farrell a statement covering this, copy of which is herewith handed you.

Yours, very truly,
THOMAS LYNCH,
President.

Mr. C. L. CLOSE,
Secretary Committee of Safety, New York.

The CHAIRMAN. That has to do with the mining business?

Mr. ROBERTS. That has to do with the coal mining; yes.

The CHAIRMAN. You spoke of six consecutive days. Do you stop your mining operations on Sunday, or do you simply work your men six days out of the week?

Mr. ROBERTS. Six days out of the week.

The CHAIRMAN. The mining goes on on Sunday as well as any other day?

Mr. ROBERTS. No, sir. There is no seven-day week.

The CHAIRMAN. That is what I wanted to understand.

Mr. ROBERTS. The next paper I have is a letter from Thomas Lynch, president of the H. C. Frick Coal Co., dated September 16, 1911, and addressed to J. A. Farrell, president United States Steel Corporation, reading as follows:

H. C. FRICK COKE CO.,
Pittsburgh, Pa., September 16, 1911.

DEAR SIR: Replying to your inquiry of the 31st ultimo, relative to hours of labor, etc., of employees at our mines and coke ovens: Beg to advise that only about 2 per cent of the employees of our coal mines and coke works work 12-hours turns, and is limited to firemen pumpers, hoisting and haulage engineers, mechanics, and attendants employed in taking care of machinery in the power houses.

The firemen average about 10 hours actual work, leaving 2 of the hours for rest. On the day turn this rest period comes toward evening, as their busiest time is about noon.

Pumpers average about six hours actual work, leaving four hours for rest and meals.

Engineers at shafts average nine hours actual work. Engineers at slopes and drifts average eight hours actual work.

Machinists and attendants in power houses average eight hours actual work.

The day men employed inside average 10½ hours from the time they enter the mine until they return. This includes haulage men, horseback men, timber men, fire bosses, brattice men, trappers, and laborers. On the average, these men consume about one hour going to and from their work, 30 minutes for lunch and an average of about one-half hour lost motion, owing to contingencies that arise during the day, which leaves an average of eight and one-half hours actual work for all the above-named men.

The miners average about 11¼ hours from the time they enter the mine until they return, from which we deduct one hour going to and from working place. It is difficult to figure the lost motion in case of the miner—how much time they have to wait on wagons and other contingencies, or the time they take for lunch, as they usually eat their lunch during these periods of loss motion, or are idle from some other cause—but I think it can safely be put at one hour, leaving an average of nine and one-fourth hours actual working time for the miners. You understand, of course, the miners do not work by the day; they work by the piece, so much per wagon.

The coke drawers likewise work by the piece, so much per oven drawn, and average about eight and one-half hours at their work, of which about one-half hour is consumed for lunch and rest.

Drivers, cagers, and some other classes of men employed in the mines and on the tipples are paid for "full run"; full run means charging the ovens, and the time of the full run is fixed by our scale at nine hours. If these men average more than nine hours they are paid extra, but nothing is deducted from their pay no matter how much less than nine hours they may finish. In normal times the actual working hours of these men do not exceed eight hours.

Ten hours constitute a day for all outside men. Nine hours is a regular day for inside day men, but, as is shown by the statement above, they do not actually work more than eight and one-half hours.

There is but little difference in the practice in the Pocahontas region from the Connellsville, except that 10 hours constitute a day's work for both in and outside men, in the Pocahontas region, but the inside day men and the miners as well spend less time in the mines than they do in the Connellsville region, mainly because the mines are smaller and it takes less time to get to and from their working places than it does in the larger mines in Connellsville. The miners also go in later in the Pocahontas region and do not average more than nine hours from the time they enter the mine until they return, about eight of which are actual work.

We have tried to give you this information as brief and concisely as possible, and if we have not covered all the points, or you would rather have it more in detail, kindly advise, and we will be pleased to furnish it.

Very truly yours,

THOMAS LYNCH, *President.*

J. A. FARRELL,
President United States Steel Corporation,
71 Broadway, New York, N. Y.

Mr. GARDNER. Before you begin the next one, I want that clear in my mind.

In this allowance of 11¼ hours, you said you deduct 1 hour going to and from the working place. You meant getting to their work, from the time they enter the mines until they go to the place where they work in the mine?

Mr. ROBERTS. Exactly; that is right.

Mr. GARDNER. Not from their homes to the mouth of the mine, but from the mouth of the mine to the place where they are to work?

Mr. ROBERTS. Yes; from the mouth of the mine until they reach their places of working.

Mr. GARDNER. I understand.

Mr. ROBERTS. Under date of August 9, 1911, Mr. Thomas Lynch, president of the H. C. Frick Coke Co., writes to Mr. J. A. Farrell, president of the United States Steel Corporation, as follows:

H. C. FRICK COKE CO.,
Pittsburgh, Pa., August 9, 1911.

DEAR SIR: Replying to your inquiry of the 5th instant: The comparative number of employed of various nationalities of our companies in the Connellsville region and Pocahontas region is, approximately, as follows:

Connellsville region.	Per cent.
American	21
Slavish	30
Polish	16½

	Per cent.
Irish	2
English, Scotch, Welsh	1½
Bohemian and French	1
Russian	1½
German	2½
Italian	9
Austrian	3
Horwat	2
Magyar	5
Croatian	1½
Hungarian	3
Colored	½
	100

That is the total percentage of nationalities in the Connellsville region.

The CHAIRMAN. Is the total number of employees given there?

Mr. ROBERTS. It does not give it. It shows the percentage. I do not know whether that is shown further along or not. I have it on another sheet, which I shall submit later on.

The CHAIRMAN. All right.

Mr. ROBERTS (continuing reading):

Pocahontas region.

	Per cent.
American	20
Slavish	7
Polish	7
Russian and Greek	1½
German	1½
Italian	14
Hungarian	24
Roumanian	5
Colored	20
	100

Mr. YOUNG. I understood you to say, "colored 20 per cent"?

Mr. ROBERTS. Yes. [Reading:]

Colored, 20 per cent; American, 20 per cent.

Showing, evidently, that American means white. In the other case, under the Connellsville region, the percentages were:

American, 21 per cent; colored one-half of 1 per cent.

In the Pocahontas region the percentage is:

American, 20 per cent; colored, 20 per cent.

The CHAIRMAN. That is in West Virginia?

Mr. ROBERTS. The Pocahontas region is in West Virginia; yes.

Prior to 1879 the operations in the Connellsville region were comparatively small, and improvements of all kinds, especially tenement houses, very cheap and crude. The houses were usually built on posts, containing three small rooms, some of them not plastered. There were many blocks of this character for four, six, and even eight families, and there was a type of shanty, as it was called, in which single men lived and did their own cooking and housekeeping. No attempt was made to establish and maintain streets or gardens, and coke ashes were spread around to dry up the mud; there were no trees or vegetation, and the black surface, together with the smoke in the atmosphere from the coke ovens, made rather squalid-looking villages.

In that connection I would say that I have some photographs here which I would like to submit for the inspection of the committee.

The CHAIRMAN. Certainly.

Mr. ROBERTS (producing photographs). Those represent the Connellsville region.

The CHAIRMAN. We have no appropriation for printing the photographs in the hearing.

Mr. ROBERTS. I thought it would be of interest to the committee to look at them, for the time being.

The CHAIRMAN. Yes. If I had the means I should be pleased to print them in the hearings, but we can not do it.

Mr. ROBERTS. These photographs represent the conditions which may be of interest to the committee at this time. They represent conditions in the Tennessee Coal & Iron Co.'s mining camps, and also in the Lake Superior ore region.

Mr. STERLING. As they are now?

Mr. GARDNER. Are those marked so that we can examine them at our leisure?

Mr. ROBERTS. They are all marked, sir, I believe.

Mr. REED. There is a legend on each picture explaining what it is.

Mr. ROBERTS (continuing reading):

The people had to depend on springs, or dug wells for their water supply, which I might also say was the custom then and is now in the small villages and towns in western Pennsylvania.

I would say, in that connection, that I made an inspection trip about a year and a half ago over the Norfolk & Western Railroad, and it was astonishing to see the improved conditions existing at the mines of the steel corporation as compared with those of the individual operations.

The CHAIRMAN. The governor of West Virginia made a report, that I shall try to get. I think I can lay my hands on it. I was reading it the other day. This report was in regard to the conditions in West Virginia governing the miners a few years ago, and shows that they were simply abominable. Human life was not safe, in a great many of them, and the governor of the State made a report of a very startling character with reference to the economic, social, and moral conditions existing among the miners of West Virginia; perhaps the most terrible conditions in any industry on this continent.

Mr. ROBERTS. If you will segregate the Steel Corporation——

The CHAIRMAN. I do. You have had nothing to do with it.

Mr. ROBERTS. I think you will find a very marked difference. [Reading:]

Up to this time fully 75 per cent of all the employees in the mines and at the coke ovens were native Americans, about 20 per cent Irish, Scotch, and English, and 5 per cent Germans.

The CHAIRMAN. When I spoke, a moment ago, about human life not being safe in a great many of those mines, I meant the lives of the labor organizers at that time were unsafe. That is what I intended to say.

Mr. ROBERTS. That was up to 1879. Seventy-five per cent of all the employees in the mines and at the coke ovens, were native Americans, about 20 per cent Irish, Scotch, and English, and 5 per cent Germans. [Continuing reading:]

The boom of 1879 and 1880 caused a very substantial expansion in the coke business and the number of ovens in the region trebled within a period of about 4 years.

About 1878, H. C. Frick & Co., the predecessor of this company, commenced to branch out. H. C. Frick & Co. did not build any new plants; it bought up old ones and added to them.

H. C. Frick Coke Co. was organized in 1882 and it did not build more than two or three new plants until after 1900. It continued the policy of its predecessor, of buying operations.

As early as 1880 H. C. Frick & Co. commenced to tear down the shanties and poorer type of houses and replace them with a better type of house, built on stone foundations, plastered, larger and more conveniently arranged; planted shade trees and laid out gardens; also put water into the villages, locating hydrants along the streets, one for every three or four families; in fact, we had water in some of our mining villages before Greensburg, the county seat of Westmoreland, had a water system. There has been no radical change in the type of house up to this day, except variation in size and detail of arrangement to make them more convenient and to substitute slate for shingle roof, but the streets have been made wider, the gardens larger, water put into many of the houses, streets and alleys kept in better condition, gutters built along the principal streets and in some cases underground sewers installed. I think I can safely say that our new villages are clean, sanitary, and well kept. The houses are almost entirely frame; some two or three plants have some brick houses.

About the same time the improvement was made in the size and character of houses, the non-English-speaking foreign workmen appeared in the region. Of course, they brought with them their native customs; for instance, would take their wash down to the stream, had the barest necessities in the way of furniture, and of the roughest kind. Families and boarders ate out of a common dish and 8, 10, and as many as 14 boarders crowded into one of these four-room houses. In summer time they moved their beds out on the porches or into the yards and slept there. Through the influence of the churches, schools, and environment, supplemented by our efforts, all this has gradually changed. Now they attempt to adorn and beautify their homes, have more and better furniture, carpets on the floors and curtains on the windows, graphophones and musical instruments of various kinds, buy better and more varied food, and there is not one overcrowded house now where there were 10 fifteen years ago.

We encourage the people to keep chickens, ducks, geese, pigs, and cows. The pens and houses for these are often built by the tenants themselves and are necessarily of various sizes and shapes and detract a great deal from the appearance of the village and make it more difficult to keep them clean and sanitary.

There are some of the types of houses first described left yet at some of the older plants—plants that have such a short life that we would not be justified in tearing them down and building new ones, but these plants are going out every year, and at those which we bought years ago, and to which we have added coal and given longer life, we have been replacing the old type of house with new ones, removing the ashes from around the town sites, filling up with good soil, so the people can cultivate gardens. For a number of years past we have been encouraging the people to make gardens and raise their own vegetables, and offer prizes for the best gardens. About 10 years ago, at the principal operations, we started flower plots in some prominent places, usually near the office, as sort of an object lesson to teach the people how to grow flowers and the kind of flowers to grow. Then we offered premiums to the women for the nicest flowers. This year a vast majority of the tenants in our houses have their own gardens and a large number of the women have a very creditable display of flowers.

As to conditions in our mines and working conditions generally about our plants, I think it is conceded that they are not surpassed anywhere. The greatest of care is exercised at all times to make the mines as healthy and safe as it is possible to make them. The only criticism I have ever heard of our company on this score was to the effect that we went to the other extreme and spent too much money for the protection of the lives and health of the employees.

In this connection perhaps it might not be out of place to add that the charge that used to be frequently made that these foreign laborers drove out the native Americans and worked for less wages than the native American is entirely without foundation, so far as the coke region is concerned. As a matter of fact this company alone at the present time has more native Americans on its pay rolls than were in the entire Connellsville region at the time the foreigners first came in, and there never has been a time that the foreigners were paid less wages than natives for similar work. The truth of the matter is there was not sufficient native labor to supply the demand created by the rapid expansion in the coke business, and there was no disposition on the part of the company, or any other operator, so far as I know, to discriminate as to nationality. The young men from the farms and from the towns do not take to coal mining at any wages. Employment agents were sent out to get labor, and the class was secured that was at that time and has since been coming into this country. As far as I know there never was a man imported from the old country to the Connellsville region, and my opinion at the present time is about half of these non-English speaking foreigners in our employ are now naturalized American citizens.

Mr. STERLING. Who wrote that letter?

Mr. ROBERTS. It was written by Mr. Thomas Lynch, president of the Frick Coke Co., to Mr. Farrell, president of the United States Steel Corporation.

The CHAIRMAN. Do the United Mine Workers of America have any organization in this company?

Mr. ROBERTS. I can not answer you that positively. I think they have.

Mr. STERLING. How long is the statement on the steel workers?

Mr. ROBERTS. Without reading it, I would like to submit, for the record, a statement in regard to the ore mining. I do not think it is necessary to take up the time of the committee to read it. Then I will come to the manufacturing end.

The CHAIRMAN. I believe you have a statement somewhere there as to the number of men employed in this region. That would be very vital in connection with what you have said. I would like also a statement from you as to the average wage paid.

The statement as to the conditions and improved houses and growing flowers, and all that sort of thing, is very interesting, but the vital question is how much money these men get a day, and how many of them there are who receive it.

Mr. REED. That is not in accordance with the sentiments so beautifully expressed by the chairman a little while ago.

The CHAIRMAN. I do not mean to say that what he has set forth there is not creditable. I am not of the opinion that "the flowers that bloom in the spring have nothing to do with the case." I approve of all that has been done with reference to having these people grow flowers around their homes. I think, possibly, the fellow working for a dollar a day has just as much right to enjoy, and is just as capable of enjoying, flowers as you or I are; and I approve of it. I do not go back one particle on that.

Mr. GARDNER. Has the rent increased that the operatives pay for these improved houses?

Mr. ROBERTS. I can not answer what the rent is. It varies with the size of the house, and they vary in size. I have no record of the rents here.

Mr. GARDNER. Have we, anywhere in our evidence thus far submitted to us, anything on that question?

Mr. ROBERTS. There is a letter here from the Lake Superior mining region which gives some data on the subject of rents; but not very fully. It is easily obtained for you. If you would like to have it submitted, I will have it put into the record.

Mr. GARDNER. I do not want to load up the record with too much matter.

The CHAIRMAN. I think that would be very vital, Mr. Gardner.

Mr. GARDNER. I think it would be interesting.

Mr. REED. There is nothing in the record so far in regard to that.

Mr. YOUNG. I would like very much to hear that report on the ore mining.

Mr. ROBERTS. You would like to have that?

The CHAIRMAN. I would like to get all you have in the way of figures. I am looking for the vital statistics. I would like to get a statement of the number of these miners and the wage paid.

Mr. ROBERTS. I have the number of miners in the H. C. Frick Coke Co.—22,640.

The CHAIRMAN. Does that include the Connellsville district?

Mr. ROBERTS. Four hundred and seventy-five of these, or 2.1 per cent, work 12 hours per day. No day laborer is worked seven days per week. A few monthly men, such as chief machinists, sometimes work seven days per week. This is simply from a summary of the statistics that I have already given here. I have that now, for all the other companies.

The CHAIRMAN. We will take our recess at this point.

Whereupon, at 1 o'clock p. m., the committee took a recess until 2.30 o'clock, p. m.

AFTER RECESS.

The committee resumed its session at 2.30 o'clock p. m.

STATEMENT OF PERCIVAL ROBERTS, JR.—Continued.

Mr. BARTLETT. Mr. Roberts, you may continue, if you please.

Mr. DANFORTH. I believe you are going to take up, next, concerning the manufacturing end of it?

Mr. ROBERTS. Yes. I had just finished giving a résumé of conditions existing in coal mining operations. I think probably I have a summary here which will answer the purpose and not weary the committee. If there are any questions which arise, I have here the full statistics from which this statement was made up, and if it is agreeable to the committee, I will put them all in evidence.

Mr. BARTLETT. A statement containing what?

Mr. ROBERTS. I have here a summary of the conditions, the labor conditions existing to-day in each of the subsidiary companies of the steel corporation, and I have here the detailed data from which that summary is prepared.

Mr. BARTLETT. You can state, in any way you desire, or the committee desires, the results of that summary, and then put the details in the record, without reading them.

Mr. ROBERTS. That is my purpose, if it meets with your approval.

Mr. BARTLETT. You can proceed and give the results you have arrived at, your conclusions, and furnish to the stenographer the details upon which you base that conclusion or those conclusions.

Mr. ROBERTS. I have given the details in regard to coal mining. It was suggested, before we adjourned this morning—I think Mr. Young asked to hear some of the details in regard to ore mining.

Mr. DANFORTH. Did he ask to hear it, or simplly to have it put in the record?

Mr. ROBERTS. I will not weary the committee with detailing it, and if it is agreeable I will submit it for incorporation in the record.

Mr. BARTLETT. You can exercise your own pleasure.

Mr. ROBERTS. And you can exercise your judgment, if you wish it to be amplified. It will take but a few minutes to read it.

Mr. BARTLETT. Go ahead.

Mr. ROBERTS (Reading):

H. C. Frick Coke Co.: 22,640 average employees. 475, or 2.1 per cent, work 12 hours per day; such as machinsts, pump men, engineers, firemen, etc. No day laborers working seven days per week.

Mr. BARTLETT. You say that no day laborers work on Sundays?

Mr. ROBERTS. No miners or laborers work more than six days per week.

Mr. BARTLETT. Those that do work seven days are what class of laborers?

Mr. ROBERTS. A few monthly men, such as chief machinists, who sometimes work seven days per week.

I understand, from the data, that that means in case of breakdowns or things of that kind; they do sometimes have to work on the seventh day.

Mr. BARTLETT. I see. Does it happen very often?

Mr. ROBERTS. It is not a regular practice; it is simply an emergency. [Reading]:

Lorain Steel Co.: 1,456 average employees; 72, or 5 per cent, work 12 hours per day. No employees working seven days per week.

American Sheet & Tin Plate Co.: 20,221 average employees; 2,614, or 12.9 per cent, work 12 hours per day. 17.3 per cent work 8 hours. Not more than 2 per cent of the total work 7 days per week. They consist of watchmen, water tenders, etc., and are always granted a day off on request.

Universal Portland Cement Co.: 2,550 average employees; 892, or 35 per cent, work 12 hours per day. About 80 per cent of force is off on Sundays. The majority of the men working on Sundays on account of the continuous operations are compelled to take a day off during the week.

Oliver Iron Mining Co.: 13,390 average employees; 1,138, or 8½ per cent, work 12 hours per day; consisting of firemen and pumpmen. Regular working day for other men is 10 hours, except wet places in mines where an 8-hour shift is in force. Firemen and pumpmen are the only men that work 7 days per week.

American Bridge Co.: 11,677 average men employed; 583, or not over 5 per cent, work 12 hours per day. No 7-day labor, except watchmen, who are always granted a day off upon request. The 12-hour men are usually on nights and work but 5 nights per week, having Saturday and Sunday nights off.

I might say, in regard to that, that those night turns of 12 hours each, 5 nights per week, are very popular with the men. They have all day Saturday, all day Sunday, Sunday night and Monday daytime to themselves. They make 60 hours in 5 nights.

Tennessee Coal, Iron & Railroad Co.: 12,656 average employees; 2,898, or 22.9 per cent, work 12 hours per day. Seven-day labor has been cut out entirely, except 1 blast furnace, where about 22 per cent of the men work 7 days. Efforts are still being furthered with the end in view of entirely eliminating it. Investigation at this plant shows that these men on 12-hour turns on the average are not actively engaged for more than 10 hours, having rest periods during the day that sum up to a little more than 2 hours. The time not actively engaged runs from more than half the 12 hours for some positions, to full time for foremen, heaters, etc., according to the position.

Positions involving heavy, constant manual labor, nervous strain or exposure to intense heat are double-manned, so that after a short period of work the man is relieved or spelled by another and thus only work half the actual running time.

American Steel & Wire Co.: 24,595 men employed; 4,919, or 20 per cent, working 12 hours per day. Have no employees at blast furnaces and steel works who work continuously 7 days per week. Only about 65 per cent of the blast-furnace men work 12 hours per day.

Open-hearth department, Bessemer and Blooming Mills: Starting time, 6 p. m. Sunday and ends Saturday afternoon. Rolling mills, mechanics and laborers begin 6 a. m. Monday morning and end 6 p. m. Saturday. The majority of the producing labor in above departments work 12 hours per day; small number work 8 hours; mechanics and laborers work 10 hours per day.

Common labor rates for Cleveland district, 17 cents per hour. Pittsburgh, 17½ cents per hour.

Open hearth, average daily earnings, $2.97; Bessemer, average daily earnings, $2.47; Blooming Mills, average daily earnings, $3.01; Rolling mills, average daily earnings, $3.69.

That is the average.

Mr. STERLING. Does that include the common laborers?

Mr. ROBERTS. Everything employed in the mills.

National Tube Co.: 17,319 average men employed. 4,037, or 23.31 per cent, working 12 hours per day. Have no employees working 7 days per week. A system is in force that compels each man to take 1 day of rest each week. No employee works 2 consecutive turns or what is called the long or change turn.

Open hearth, Bessemer and rolling mills, starting time 6 p. m. Sunday; ending time from 3 to 4:30 Saturdays; 12 hours per day.

That means 12 hours per turn.

Finishing mills, National Works, McKeesport, starting time 6 p. m. Sunday; ending time, 4.30 p. m. Saturday; 10 hours per day. All other finishing mills start 6.15 to 7 a. m. Monday and end from 11.40 a. m. to 4.30 p. m. Saturdays; 10 hours per day.

Mr. BARTLETT. 11.40 a. m. Saturday? Do you mean by that that is a half holiday?

Mr. ROBERTS. Yes. It is the practice of the mills there to cease operations by noon on Saturday, so that the men get a half holiday on Saturday.

Common labor rate, Wheeling, 17 cents per hour; common labor rate, Chicago, 17 cents per hour; common labor rate, Pittsburgh, 17½ cents per hour.

Open hearth, average daily earnings, $2.95; Bessemer, average daily earnings, $2.80; rolling mills, average daily earnings, $2.93; finishing mills, average daily earnings, $2.36.

There, you see, you get into another character of work. Each one of these individual subsidiary companies are not comparable in their wages and character of work, class of men, and so on, which makes them different; also the geographical location.

Those figures show some positions slightly less than the others, due to the fact that probably those finishing mills take a less skilled class of labor.

Mr. BARTLETT. How does the geographical situation affect it?

Mr. ROBERTS. It affects the labor rate. You will find Pittsburgh has probably the highest labor rate; some of the southern works lower; some of the eastern works lower. You will find there is no uniformity. It is not so you can say the Steel Corporation pays the same rate everywhere. Each of these individual companies are what might be termed a State entity within themselves.

Mr. BARTLETT. They are affected by local conditions?

Mr. ROBERTS. Yes. It is largely, sometimes, the supply and the demand in the labor market, like anything else.

Mr. YOUNG. It seems to me we used to understand and read about a good many men in the mills getting as high as ten or twelve or even fifteen dollars a day.

Mr. ROBERTS. Not very many. Those were men who were known as rollers, especially what was known as a guide-mill roller. A guide-mill roller is somewhat of a genius. That was the rolling of a small sized, especially round shape, three-quarter inches in diameter up to, say, 1¼ inches in diameter. They said a man was never made a guide-mill roller; he was born one. It is due to an extreme skill in changing temperatures, and those men made very high wages.

Mr. STERLING. Do they pay any men such wages?

Mr. ROBERTS. Yes. I think the guide-mill rollers to-day get twelve or fifteen dollars.

Mr. STERLING. Going back 15 or 20 years, were there not more men in those works that got higher wages?

Mr. ROBERTS. In proportion, yes, sir. The effect of substituting machinery for these laborious and skilled operations has been to elevate the minimum wage and to depress the maximum wage. As a whole, it has brought men nearer to an average. That is, the average is not made up of such extremes.

Mr. STERLING. It does not require such a high degree of skill in a man since they have the machinery?

Mr. ROBERTS. No; the machinery does it. Before, not only skill, but muscular skill and power had to be combined. Now that is eliminated. [Reading:]

Investigation shows that these men on the 12-hour turns on the average are not actively engaged in work incident to their duties more than three-fourths of the time, or nine hours out of the twelve. Men employed on extra hard work or exposed to intense heat are spelled at certain short intervals.

The next I have is the Carnegie Steel Co.:

Thirty-one thousand seven hundred and sixty-one average men employed. Seventeen thousand one hundred and fifty, or 54 per cent, working 12 hours per day.

Mr. BARTLETT. Have you read the report of the Commissioner of Labor, to the Senate resolution?

Mr. ROBERTS. I have not. But, as I said this morning, I take it that represents the steel industry as a whole.

Mr. BARTLETT. I did not hear you this morning, and that is the reason I asked.

Mr. Roberts. I claim the conditions in the Steel Corporation are on a much higher plane than the conditions which exist in the mills of its competitors.

Mr. REED. Mr. Stanley has already stated that was the conclusion he formed, after his investigations.

Mr. ROBERTS. [Reading:]

A system has been devised, which differs in the various plants, to give each man one day of rest in seven. Only 3.4 per cent of all men employed in the blast furnace and steel works departments now work seven days per week. Further efforts are being made to reduce this percentage.

Open hearth starting time: Seventy-two per cent of the men start work from 9 to 12 Sunday morning—

I do not understand that statement. I got that only within 24 hours. Either it is a mistake, or it is not necessary.

Mr. BARTLETT. What place is that?

Mr. ROBERTS. At the Carnegie Mills, "open-hearth department, 72 per cent of the men start work from 9 to 12 Sunday morning." I think it is 9 to 12 Sunday night, because Sunday morning is not necessary. As a member of the board of directors of the steel corporation I would like to know why it is done, if it is done.

Mr. BARTLETT. You can find out?

Mr. ROBERTS. I can find it out. I think it is a misprint.

Mr. REED. Will not your detail show that, Mr. Roberts?

Mr. ROBERTS. I will have that looked up while I proceed.

Open hearth starting time: Seventy-two per cent of the men start work from 9 to 12 Sunday morning; 27 per cent from 3 to 6 p. m. Sunday, ending anywhere from 9 a. m. to 6 p. m. on Saturday. Bessemer and rolling mills start 6 p. m. Sunday and end before 6 p. m. on Saturday. Twelve hours constitute a day's work in the above departments. Common labor rate, 17½ cents per hour.

Open hearth, average daily earnings, $3.03; rolling mills, average daily earnings, $2.78.

Investigation shows that these 12-hour men are not actively engaged the entire turn, having rest periods which sum up from three to six hours, according to the position.

Illinois Steel Co.: 17,450 average employees. 10,470, or 60 per cent, work 12 hours per day.

Joliet works: Only five-tenths of 1 per cent of the men enrolled are working seven days per week. They consist of machine shop and labor men, and work seven days only in emergency.

South works: About 4 per cent of the men enrolled work seven days per week.

Milwaukee works: No men working over six days per week.

Gary works: Working on plan to eliminate seven-day work. It is being put into full effect as rapidly as possible.

Open hearth starts 6 p. m. Sunday and ends 6 p. m. Saturday.

Bessemer starts 3 a. m. Monday and ends 3 a. m. Sunday.

Rolling and finishing mills start 6 a. m. Monday and end 6 a. m. Sunday.

I might say, in starting a plant such as Gary, until you get a sufficient number of understudies broken in, it is difficult to man it on this plan of eliminating seven-day work entirely. But as the town grows up around it, and labor becomes more plentiful, it is possible to do it.

Mr. YOUNG. How do you manage if the mill runs continuously to have just one day without having a considerable number of men that are idle a good deal of the time?

Mr. ROBERTS. They keep a surplus force which they put in the place of these regular men, making these men retire after six days' labor. It is not always on the seventh day that they retire.

Mr. YOUNG. Part of them take the place of one set of men on Monday, and another set of men on Tuesday?

Mr. ROBERTS. That is right. It means keeping more men.

Mr. YOUNG. I see.

Mr. ROBERTS (reading):

Twelve hours constitute a day's work, except for mechanical men, who work 10 hours, and tonnage men in Bessemer and rail mills, who work 8 hours.

Common labor rate, 17 cents per hour. Open hearths, average daily earnings, $3.02; rolling mills, average daily earnings, $2.70.

Of the total number of employees of the Steel Corporation, those working at the blast furnaces amount to 5.02 per cent. I think it has been testified here that a large percentage of employees were engaged in blast-furnace work. The total is about 11,000, and the total number of employees is some 200,000. So that the total of the blast-furnaces employees to the whole number employed is about 5 per cent.

Mr. STERLING. This statement you have just read came from the bookkeepers and the timekeepers of the several industries?

Mr. ROBERTS. It is made up from a report on the part of the president of each subsidiary company to the officials of the United States Steel Corporation, and attached to his letter are a great number of statistics. For instance, we have statistics here of two months' operation of a blast furnace, with the individual names of the men working at the blast furnace, and the number of actual days they made; the actual time they were off, and so on. So that in this pile of statistics I have here you have absolute data.

Mr. STERLING. Are those statistics tabulated? Are there tables to be submitted among those papers you have there?

Mr. ROBERTS. Yes. Here is the Carnegie Steel Co.——

Mr. STERLING. It seems to me those tables ought to go in right after this statement which has been read by Mr. Roberts.

The CHAIRMAN. I would like to have Mr. Roberts, as he explains the table, turn it over to the stenographer, so that he can insert it at that place.

Mr. ROBERTS. I do not want to weary the committee. I am getting off of an eight-hour basis, if I keep you here to-night

Mr. DANFORTH. How many of these men work more than 12 hours a day?

Mr. ROBERTS. None.

Mr. DANFORTH. We have heard some talk about some working 24 hours a day, to get a day shift.

Mr. ROBERTS. The old-fashioned blast furnace practice was that men worked, as I say, 12-hour turns; seven turns a week. That is, there were 14 turns in a week, and when they made a change, which was customary, in some cases every week, and in some cases every two weeks, those men worked the clock around.

Mr. DANFORTH. How lately has that been done in any of the subsidiary companies?

Mr. ROBERTS. It has varied in different mills. There has been a tendency, ever since the Steel Corporation was formed, to make changes at a good many of these subsidiary companies. Some have put these changes into effect more rapidly than others, due, as I said this morning, to local conditions and the conditions of their plants; how they were balanced, and so on. But they have now, in this final scheme, which has been worked out, no men working two turns.

The CHAIRMAN. You mean that at the present time no man in the Steel Corporation is allowed to work more than 12 hours under any circumstances at any one time?

Mr. ROBERTS. No, I won't say that. In emergencies and breakdowns——

The CHAIRMAN (interposing). I mean except in case of fire or accident.

Mr. ROBERTS. I understand that it is the practice now that there is no turn of over 12 hours, and that in a very short time there will be not more than six turns per week anywhere.

The CHAIRMAN. How long has it been since one man worked more than 12 hours in order to make these shifts from the night to the day?

Mr. ROBERTS. That I can not give you.

The CHAIRMAN. That was the custom?

Mr. ROBERTS. That was the custom of the blast furnaces in this country prior to the formation of the steel corporation.

The CHAIRMAN. Did the Steel Corporation adhere to that custom until recently?

Mr. ROBERTS. They adhered to that custom for some time, in the meantime perfecting their arrangements whereby they could dispense with it.

Mr. DANFORTH. Did they adhere to that custom as lately as 1907?

Mr. ROBERTS. I could not tell you that.

The CHAIRMAN. I noticed that reference in your report.

Mr. ROBERTS. As I said, I would like you to be sure that it is not universally accomplished yet. There are men that work the two turns.

The CHAIRMAN. Now?

Mr. ROBERTS. In some of the furnaces; but the policy of the Steel Corporation is to do away with that.

The CHAIRMAN. What I want to get at is whether it was the purpose of the Steel Corporation to inaugurate this reform, or whether it was an accomplished fact.

Mr. ROBERTS. No. The steel corporation inaugurated that reform. But, as I said this morning, time is an element in these changes. You can not introduce them instantly. You may form that as your policy, wish that as your policy.

Mr. YOUNG. As I understood your statement, that reform had been accomplished in a large number of plants, but there were some places where it was not in there.

Mr. REED. You could make it stronger than that, and say at 95 per cent of the plants.

Mr. YOUNG. Is that about right, Mr. Roberts?

Mr. ROBERTS. That is correct, sir, I think.

Mr. DANFORTH. Did you find out about that Sunday work from your minutes?

Mr. ROBERTS. It is in a telegram I have among these papers, which reads: "9 a. m. to 12 a. m. Sunday." I think it is a mistake.

Mr. REED. I think it is a mistake.

Mr. YOUNG. Will not the accompanying papers show?

Mr. ROBERTS. No, sir; that is simply a telegram.

Mr. BARTLETT. Can not Mr. Roberts find out about it definitely, and if it is wrong he can correct it; otherwise, let it stand?

Mr. ROBERTS. I will let it stand, unless I find it is wrong.

Mr. GARDNER. I have here, from a synopsis prepared by the Commission of Labor, the wages in the steel industry. This, of course, refers to the whole industry; not to you especially. It says the most common rate per hour for unskilled labor in the New England district was 15 cents. What is this now in that district?

Mr. ROBERTS. In steel making we have a wire works at Worcester, Mass.

Mr. GARDNER. What is your rate for unskilled labor in the wire works at Worcester?

Mr. ROBERTS. I have not that data here. All the steel and wire data I have here is west of Pittsburgh.

Mr. GARDNER. It says the most common rate per hour for unskilled labor in the eastern district is 13 and 14 cents.

Mr. ROBERTS. I might say the works of the American Bridge Co., near Philadelphia, the steel works there, are paying 15 cents an hour.

Mr. GARDNER. For unskilled labor?

Mr. ROBERTS. For unskilled labor.

Mr. GARDNER. What is meant by the "Eastern district?"

Mr. ROBERTS. East of Pittsburgh.

Mr. GARDNER. Does it include the State of New York?

Mr. ROBERTS. It would include New York, yes; include New York, New Jersey, and eastern Pennsylvania. I think that the line, possibly, had better be drawn at Harrisburg, rather than Pittsburgh, because Johnstown is rather considered within the Pittsburgh district.

Mr. GARDNER. The most common rate per hour for unskilled labor in the Pittsburgh district is 16 and 17 cents.

Mr. ROBERTS. The Steel Corporation's unskilled labor in the Pittsburgh district is 17½.

Mr. GARDNER. That is uniform?

Mr. ROBERTS. That is a uniform rate in the Pittsburgh district.

Mr. YOUNG. You mean a uniform average?

Mr. ROBERTS. Uniform in the Steel Corporation's plants.

Mr. YOUNG. All common labor, every man?

Mr. ROBERTS. Seventeen and a half is the minimum wage; not every man—the minimum wage.

Mr. YOUNG. Nobody gets less?

Mr. ROBERTS. Nobody gets below that. That is the minimum wage.

Mr. GARDNER. Now, then, let us return. That is a different statement. Turn to the eastern district. I quoted from the report that the most common rate per hour for unskilled labor covering the whole trade in the eastern district is 13 and 14 cents an hour. What is your rate?

Mr. ROBERTS. Fifteen.

Mr. GARDNER. In the eastern district, that would take in Philadelphia?

Mr. ROBERTS. I know the rate in the Bridge Co.'s plant at Philadelphia is 15 cents, and the rate in other works within a radius of a few miles is from 13 to 14.

Mr. GARDNER. Is the bulk of your unskilled labor at that rate? That is, the wording says: "The most common rate for unskilled labor."

Mr. ROBERTS. You must bear in mind that there is not a large percentage of the men in these various works who are paid by the hour. They are paid by the ton; the 12-hour men, very largely. So that it is only those that are paid by the hour that get the 17 cents.

Mr. GARDNER. In the case you read us I noticed several times the recurrence of the hour rate for unskilled labor—in what you have just been reading to us.

Mr. ROBERTS. That is the basis. It is the minimum basis which is submitted. For unskilled labor, it is on a basis of 16, 17, and 18 cents an hour.

Mr. GARDNER. What I want to get at is whether the bulk of unskilled labor is on the minimum basis or on some basis higher than the minimum.

Mr. ROBERTS. I should say it varied in different plants, but when it is on a tonnage basis it would make better wages than the minimum wage rate.

Mr. GARDNER. Now, to go on: The most common rate per hour for unskilled labor in the Great Lakes and Middle West district is 15, 16, and 17 cents.

How do your wages compare with that?

Mr. ROBERTS. 17, I believe, in Chicago.

Mr. GARDNER. Is 17 your minimum wage for unskilled labor all through the district of the Great Lakes and the Middle West?

Mr. ROBERTS. I so understand.

Mr. GARDNER. In the southern district it is given as 12½, 13, and 13½ cents.

How about your rates?

Mr. ROBERTS. In Tennessee there are, I believe, two rates. There is one of 13, and I think another one of 15. As I recall, I think there

are statistics in this pile. I know I have read that within the last day or two.

Mr. GARDNER. The next sentence in the synopsis is this: "It must not be assumed, of course, that employees working at these rates and at hours here shown can work through the night, for employment in the iron and steel industries is very irregular, and most irregular among the men of the least skill and working at the lowest wages."

What comment have you to make on that? Is that correct

Mr. ROBERTS. That is a self-evident proposition. If there is not sufficient activity in the industry to employ the mill's fullest time, the men will not make the amount of wages they will when they are on full time.

Mr. GARDNER. Yes; but is that a fact, that employment in the iron and steel industries is very irregular; it is most irregular among the workmen of least skill, working at the lowest wages? Is that a fact?

Mr. ROBERTS. No. They are just as necessary for the operation of the works as the men who are highly skilled.

Mr. GARDNER. That is, the irregularity strikes all classes of labor alike, does it?

Mr. ROBERTS. And is not peculiar to the iron and steel trades only. If you have a period of depression, you slow up, but everything slows up with it. If you reduce your tonnage, you can not reduce the number of positions in your works. They simply slow down. You may run five days a week instead of six.

Mr. GARDNER. But this slowing up of production does not throw out of employment any more, proportionally, of one class of labor than of another class of labor?

Mr. ROBERTS. Not at all, sir.

Mr. REED. Mr. Chairman, it has occurred to us, and it has been suggested by Mr. Roberts, that it is probable the committee would have a better understanding of the conditions of labor, as well as a better understanding of the whole steel business, if the committee could visit one of the large steel plants of the country. I want to say in behalf of the corporation that if the committee cares to fix a time to visit one of the large mills in the Pittsburgh district, we would be only too glad to see that it is given every facility to inspect the operation of the plant.

Mr. ROBERTS. Might I suggest, in that connection, that it would seem to me extremely valuable if you could embrace, in that inspection, two plants; one representing a plant which has been taken over by the Steel Corporation, or had been in existence prior to its organization, and then to inspect the newest plant at Gary, which has been developed entirely by the Steel Corporation, in accordance with its ideas of what should be done? You would then see the differences.

Mr. REED. And the committee will get more knowledge and more accurate knowledge from a two-days' visit of that kind than it will from two weeks of testimony. We are quite confident of that.

Mr. STERLING. Would we be able to get any light on the labor proposition—the condition of laborers, and everything of that kind?

Mr. REED. You would be able to see what the men do. A description of it from Mr. Brandeis, for instance, might not give you the same impression as a visit to the works.

Mr. GARDNER. Mr. Brandeis had not visited the works, had he?

Mr. REED. No.

Mr. Brandeis's information came from two books that he read.

Mr. STERLING. Mr. Brandeis based his knowledge only on Mr. Fitch's book and on the report of the bureau.

The CHAIRMAN. We know to what extent the bureau is reliable and these witnesses whom we have heard.

Mr. GARDNER. I think, if possible, we ought to go.

The CHAIRMAN. I was going to say this: I would be delighted to have the committee go, but we have bankrupted the United States. We have spent $34,000 in securing information, more information than was secured by the Bureau of Corporations by an expenditure of close to a million—$500,000 by the Steel Corporation, and $200,000 or $300,000 a year by the Government.

I am entirely satisfied that this money was not wantonly or foolishly spent. I do not, however, feel like going to the House for an additional appropriation, unless the committee so chooses. I am economizing one very turn, in order to finish this investigation on the amount of money appropriated. It is perfectly appalling—the agony that some people are undergoing because of the expense this committee has gone to.

Now, I do not feel that we ought to make this trip at the expense of the Government. I am willing to pay my own expenses, and I would be pleased to have the committee go, if they would go in that way.

Mr. STERLING. I will go on that basis.

Mr. YOUNG. I would be very glad to go, if I can get the time. I would rather pay my own expenses.

The CHAIRMAN. That is the way I would like to go. I would not feel like asking the House for anything.

Mr. YOUNG. Do we pay for our printing, or does that come out of another appropriation?

The CHAIRMAN. No. Everything else.

Mr. ROBERTS. I regret extremely that our hands are tied, in regard to inviting you.

Mr. REED. Of course, we can not do that.

The CHAIRMAN. I think it would be an excellent idea if the committee could go; but I am continually admonished about the great expense we are putting the Government to; and for that reason I am exercising the closest economy.

Mr. ROBERTS. I would like, Mr. Chairman, just to say one thing in regard to these statistics: I will put them in. But at the present time, in my opinion, we have got an epidemic of statistics. Statistics to anyone who does not understand them are a good deal like a loaded weapon that may go off.

Mr. BARTLETT. You mean they would not know how to handle them any more than a child knows how to handle a gun?

Mr. ROBERTS. Exactly. It is very much the same as if a layman attempted to study a law case and he was given the cases which bore on that, and he did not know what to do with them.

Mr. BARTLETT. I have seen a good many lawyers that way, who got absolutely mental dyspepsis trying to digest a case.

Mr. ROBERTS. And it is the same way with a layman.

Mr. YOUNG. This committee ought to be able to handle statistics with some reasonable degree of intelligence.

Mr. ROBERTS. I am speaking of these statistics. When you come to compare them with the statistics which you have already had presented to you—for instance, take the statistics of the Bureau of Corporations or the statistics of the labor department. At once, if you are an expert, questions arise, How were these statistics prepared?

Mr. YOUNG. Certainly.

Mr. ROBERTS. On what basis were they prepared; were these wages during full employment or partial employment, and so on. At once a number of questions suggest themselves that will not suggest themselves to the mind of some one who has not been actively engaged in that particular occupation.

The CHAIRMAN. Have you some statistics there?

Mr. ROBERTS. I have a pile here, sir, from which this report which I have read has been made up.

Mr. YOUNG. I think they ought to go with it. They are really a part of it.

Mr. ROBERTS. If agreeable to you I will put them all in.

Now, that represents all I have to say on the subject of hours and conditions of labor.

The CHAIRMAN. At that point I did not get to hear that part of your testimony, and I regret it very much, Mr. Roberts, but I was detained by a vitally important committee meeting that I could not leave at the moment.

You have got these statistics showing the wages of the employees in each one of your subsidiary companies?

Mr. ROBERTS. Largely.

The CHAIRMAN. Do those statistics cover the numbers and nationalities of these employees?

Mr. ROBERTS. The number of men employed, but not the nationalities in all cases.

The CHAIRMAN. In many cases?

Mr. ROBERTS. I gave the nationalities this morning in the coal-mining operations. I think there are some statistics there on behalf of the Carnegie company, as to their nationalities. I think that has already been put in the record. I think I have seen it in the record already.

The CHAIRMAN. Have you the nationalities as to the Gary plant?

Mr. ROBERTS. No.

The CHAIRMAN. Could you give me those statistics?

Mr. ROBERTS. I presume they have them on record. If you would like them I will see if I can obtain them.

The CHAIRMAN. I would like to have them.

Have you statistics as to the wages of employees on your transportation roads?

Mr. ROBERTS. I have not them with me, but I presume I can get them for you.

The CHAIRMAN. Can not you do that? I regard it as vitally important.

Mr. ROBERTS. I will see if I can get them.

The CHAIRMAN. I suppose you keep a record of those in your transportation department as you do in your other departments?

Mr. ROBERTS. Oh, undoubtedly, the transportation companies have their records of wages. I felt the transportation matters were

so subject to the conditions of all common carriers that they would not be of interest to this committee.

The CHAIRMAN. That is exactly what makes them of interset. I do not know what your wages are or how they will compare; but there are two inquiries here that are vitally interesting to this committee. The first is, the steel corporation is charged with being inimicable to organized labor, with opposing it.

Mr. ROBERTS. That has reference to transportation conditions?

The CHAIRMAN. No. It could not do it with reference to transportation companies.

Mr. ROBERTS. Why not?

The CHAIRMAN. Because the transportation companies of the steel corporation are so similar to other transportation companies that if you were to attempt to run your engines with men who are not members of the Brotherhood of Locomotive Engineers it would cause a large amount of trouble. You dare not do so with your transportation companies, as far as organized labor is concerned, because, in my opinion, the steel corporation would not oppose organized labor elsewhere than in its transportation business for any other reason than the impossibility of doing it.

Mr. ROBERTS. I can not agree with that.

The CHAIRMAN. Why do you permit it in transportation companies, if nowhere else?

Mr. ROBERTS. Because every tub must stand on its own bottom.

The CHAIRMAN. Why does that tub have a different bottom from other tubs?

Mr. ROBERTS. The labor organizations as known among the transportation companies are on a very different basis from those in the manufacturing industries. That is one reason.

Mr. REED. In what respect?

Mr. ROBERTS. Well, one respect is that they are not a monopoly; that they permit of the open shop—two most important considerations.

Mr. STERLING. Is not that the policy of the Steel Corporation in its manufacturing and mining plant?

Mr. ROBERTS. Exactly.

Mr. STERLING. You do not, or do you, bar men from your mills and mines because they are connected with union labor?

Mr. ROBERTS. So far as I understand it, the policy of the United States Steel Corporation is that their works are open to all men who apply for work and are capable of performing it.

Mr. BARTLETT. And who comply with your regulations.

Mr. ROBERTS. And comply with our regulations.

The CHAIRMAN. Do you keep a man in your employ who attempts to organize a union, if you know it?

Mr. ROBERTS. Of course, as far as the Steel Corporation is concerned, and what would come under my knowledge as a director of that, I should say would be a question entirely of what that man attempted to do.

The CHAIRMAN. If he attempted to form a union?

Mr. ROBERTS. There again you have——

The CHAIRMAN (interposing). If he was an organizer?

Mr. ROBERTS. It depends upon what kind of organizer he is.

The CHAIRMAN. An organizer of labor.

Mr. ROBERTS. It depends on what the organizer of labor was doing.

The CHAIRMAN. If he was simply going about among the men, taking their names and collecting dues for the purpose of forming a peaceful, compact, and militant union?

Mr. REED. Peaceful and militant?

Mr. ROBERTS. You use the word "militant" to the exclusion of all other sense?

The CHAIRMAN. No; when I use the word "militant," I mean this, self-sustaining, determined to deal collectively and not individually, with cooperation.

Mr. ROBERTS. Now, Mr. Chairman, my views on that subject, and they are entirely personal, of course—I hold no brief for anyone but myself—are that I see no reason whatever why men should not combine together to dispose of their labor any more than that men should combine together to use their capital; none whatever, provided, however, that both are under governmental control. And that, in addition to that, they have full liability imposed upon them for all their undertakings. And, in addition to that, that neither side has any monopolistic tendency.

Mr. BARTLETT. That is about the law now. That would apply both to labor organizations and industrial organizations.

Mr. ROBERTS. No. The difficulty with the usual labor organization to-day is that its first and great requirement is that of a monopoly without any liability whatever.

Mr. BARTLETT. You speak of a bad labor organization. I say that is practically regulated by law now, as far as monopoly is concerned.

Mr. ROBERTS. No. The closed shop represents monopoly pure and simple. There is no law to prevent the closed shop; there is no liability. A labor organization makes a contract to-day; there is no liability on its part if it does not perform its contract.

Mr. BARTLETT. The same liability as against any other person, artificial or natural; which is liable under the law for damages.

Mr. ROBERTS. It is not an incorporated organization.

Mr. BARTLETT. It has the same liability that attaches to any person or to any organization, for a violation of its contract. It is liable under the law for damages.

Mr. ROBERTS. Where would you find it; how would you catch it?

Mr. YOUNG. What would you sue on?

Mr. BARTLETT. They have a case in Connecticut, which will answer that.

Mr. REED. Do you know how you could collect on judgment?

Mr. BARTLETT. No. I suppose their judgment would be as good as a judgment against any people who have judgments entered against them, and nothing with which to pay them.

The CHAIRMAN. As I understand it, you do not object to such labor unions as do not exist.

Mr. ROBERTS. There is no reason why they should not exist.

The CHAIRMAN. I say, the labor union to which you have no objection, the organized labor which you are willing to endure, is the kind of organized labor that, according to your own definition of it, does not exist in this country.

Mr. ROBERTS. The organizations as they exist to-day are in different degree. The average one is in no sense an American institution,

absolutely foreign, imported, and has no place in the institutions of this country. That is my belief.

The CHAIRMAN. Yes.

Mr. ROBERTS. Now, you come to a different type of union represented, for instance, in the American Brotherhood of Locomotive Engineers, on an entirely different basis, one that has had a most honorable career, and I think as a rule has had the support of the community at large.

Mr. BARTLETT. How would you suggest that labor organizations or capital organizations should be regulated or controlled by the Government?

Mr. ROBERTS. I am speaking now in the sense of chartering, either local or national. I do not think possibly it is necessary by the State, but that organizations of labor should be chartered the same as organizations of capital.

Mr. BARTLETT. Don't they recognize labor organizations; are they not chartered by some State?

Mr. ROBERTS. I do not think so. I do not think any of them are incorporated; not to my knowledge.

Mr. BARTLETT. I thought they were.

Mr. STERLING. Has the attitude of the Steel Corporation changed with reference to labor unions at any time since they have been organized?

Mr. ROBERTS. That is a question that I can hardly answer, due to the fact that there is a period there from 1902 to 1909 that I was not connected with the corporation, and I am not familiar with what its policies might have been.

Mr. STERLING: Is its attitude toward organized labor pretty much the same in all the subsidiary companies?

Mr. ROBERTS. No, I should say——

Mr. STERLING (interposing). Do they all pursue the same policy in reference to it?

Mr. ROBERTS. I should say not. There are union men working for the Steel Corporation to-day, members of various unions.

Mr. BARTLETT. Do you know what proportion of union men are employed?

Mr. ROBERTS. No, I do not.

The CHAIRMAN. In what business?

Mr. ROBERTS. In the various works.

The CHAIRMAN. Outside of your transportation companies?

Mr. ROBERTS. Oh, yes. They are known as machinists—various unions are represented.

Mr. GARDNER. Stationary engineers.

Mr. ROBERTS. I can not give all of them.

The CHAIRMAN. Those men are men that come to prepare your plants.

Mr. ROBERTS. Oh, no; they are permanent employees. There is no order or no policy of the Steel Corporation that you shall not be a union man, none whatever.

Mr. BARTLETT. There is a preference given to a nonunion man?

Mr. ROBERTS. No. There is no question in that respect asked. So long as this shop is an open shop it is open to any one who is able to work in it and wants to work in it. That is all.

The CHAIRMAN. I understand the minutes of the executive committee of the Steel Corporation—it is in the record—state the attitude of the United States Steel Corporation is as opposed to the organization of labor; they discourage it.

Mr. ROBERTS. If you have that, Mr. Chairman, of course I defer to the printed record. But I think you will find that is not an organization in general, but probably has some reference to some particular organization.

The CHAIRMAN. It does not refer to any particular one.

Mr. ROBERTS. Of course, the minutes will speak for themselves.

The CHAIRMAN. With what company were you connected in 1902?

Mr. ROBERTS. After the spring of 1902 I was a director of the United States Steel Corporation and a member of its executive committee.

The CHAIRMAN. Were you connected with any particular subsidiary?

Mr. ROBERTS. None whatever.

The CHAIRMAN. Do you know whether at that time the various subsidiary companies of the United States Steel Corporation kept a list of men who had attempted to form unions, which list was furnished to the various subsidiary companies.

Mr. ROBERTS. That the steel corporation kept a list?

The CHAIRMAN. Yes, and the various subsidiaries kept a list. I am asking if they did.

Mr. ROBERTS. I do not know.

The CHAIRMAN (continuing). Of these men, for the purpose of identifying them in case they asked to be employed.

Mr. ROBERTS. If they kept any such lists, I never heard of them.

Mr. STERLING. Do they have a black list of that kind?

Mr. ROBERTS. No. I think in very many of the companies they have a system of recording, a card catalogue, so to speak. When a man applies and enters their work, they record his age, whether married or single, nationality, his record, where he has worked; and then if he is discharged they enter on that card the reason for his discharge. It is simply a mere catalogue; that is all.

Mr. BARTLETT. It is just kept for information of the steel corporation.

Mr. ROBERTS. It is not in the least what you might term a black list. It is a universal list.

Mr. BARTLETT. I did not mean to ask if it was a black list. Is that kept primarily for the information of the steel corporation, or is it accessible to any other?

Mr. ROBERTS. It is only kept for the information of the subsidiary company keeping it.

Mr. BARTLETT. And not for other companies?

Mr. ROBERTS. Oh, no.

Mr. BARTLETT. And for no other manufacturers?

Mr. ROBERTS. It is only a matter of record in case of death or accident, where they can communicate with a man's family, for instance, if he is a foreigner, when he comes there.

Mr. BARTLETT. Or if he applies again for employment, to the same company.

Mr. ROBERTS. That is all, to know where he had been in their employ, and so on.

Mr. BARTLETT. And not for the purpose of giving information to anybody else?

Mr. ROBERTS. Oh, no; nothing whatever of that kind.

Mr. GARDNER. Did you read the evidence before this committee of a reporter for the Pittsburgh Leader about a week ago?

Mr. ROBERTS. I did not; no.

Mr. GARDNER. The statement was made by him that at some time he had worked on a list, I think, probably, in 1909, that gave a list of men who had been discharged from the Steel Corporation over a number of years, which he could not specify; that against certain numbers of these names it appears that the man was discharged for cause; against other names that he was a labor organizer or labor agitator; that he was uncertain whether it was circulated in the steel trade in general, because I asked him whether it went to Jones & Laughlin or not, and he did not know; but at all events he was quite convinced it was circulated amongst the subsidiary companies. Do you see?

Mr. ROBERTS. I see.

Mr. GARDNER. Do you know to what that refers?

Mr. ROBERTS. I have not any idea whatever.

Mr. YOUNG. Have you heard of anything of the sort?

Mr. ROBERTS. It never reached me in the Steel Corporation.

Mr. YOUNG. You were out of the Steel Corporation between 1902 and 1909?

Mr. ROBERTS. Yes, sir.

Mr. YOUNG. What time in 1909?

Mr. ROBERTS. It was the autumn of 1909, some time; I do not recollect. Late in the year, however.

Mr. YOUNG. Would you have been familiar with it if such a list had existed during your connection with the Steel Corporation?

Mr. ROBERTS. If it had been any matter of policy of the Steel Corporation as a corporation I should have known of it, I think.

Mr. YOUNG. If it was the custom among subsidiaries to circulate amongst themselves such a list you would have known of it?

Mr. ROBERTS. That might be questionable; I do not know whether it would have reached the Steel Corporation or not.

Mr. YOUNG. Are you familiar with the Homestead plant?

Mr. ROBERTS. More or less so; more so in the early days, or prior to the Steel Corporation, by actual visiting, than I have been since.

Mr. YOUNG. Are you familiar with the conditions under which men live there during the last three or four years, common labor men?

Mr. ROBERTS. Not by personal visiting.

Mr. YOUNG. I asked you that because we had a lady here before us who testified to the conditions at Homestead. She was a settlement worker, and had written a book in which she claimed that the sanitary conditions of a large number of these men were very bad; that their houses were grouped around small courts, which were very filthy; that the houses contained, I think, only two rooms downstairs and two rooms upstairs, and were occupied by two families, and very many persons.

I wondered if you knew anything about them.

Mr. ROBERTS. But it was not represented that those conditions existed within the sphere of the Homestead works or the subsidiaries

of the Steel Corporation, or the corporation. Those were municipal conditions beyond the control of the Steel Corporation.

Mr. YOUNG. As I understood her, these houses were owned by the Carnegie Co., as part of their plant where they kept their men.

Mr. REED. She did not testify to that; and the fact is they do not own any of them.

Mr. ROBERTS. I do not know whether they own any of the houses at Homestead.

Mr. REED. Her testimony has provoked the most indignant denials of the municipal authorities of Homestead. If the committee wants to hear them I will give them their names.

Mr. ROBERTS. We have trouble enough of our own.

Mr. YOUNG. I was trying to find out what the fact was.

Mr. ROBERTS. I do not understand any of those sociological matters touched upon here are within the sphere of the corporation, at all. The only points at which the corporations control any of the settlements are in the mining regions. I gave some figures here this morning showing the conditions in the mining region.

Mr. YOUNG. So that at none of the steel plants do you own the houses?

Mr. ROBERTS. At Gary we own some.

Mr. REED. And at Vandergrift?

Mr. ROBERTS. There are some, but I do not think at any of those works we are at all ashamed of conditions. For instance, I have some photographs here under a section of work which I was going to touch upon later, known as "Welfare work." These are playgrounds and gardens at various points.

If I am not wearying you too much, and get through with what little I have left, then I will feel open for anything you have to say. But I do want to touch upon this matter, "old age at forty."

Mr. DANFORTH. Do I understand you to say that at Homestead the Carnegie Co. owns none of the houses?

Mr. ROBERTS. I so understand.

Mr. DANFORTH. I understood the testimony differently myself.

Mr. ROBERTS. I do not understand the situation that was complained of is within the scope of the corporation or any of its subsidiaries. I do not understand that there was a visit made by the same workers to the shops at Ambridge, belonging to the American Bridge Co., and an inspection made of those, of the housing, and so on. When the report was written, before publication it was submitted to the officers of the Steel Corporation, I believe, and they asked why Ambridge was not included in the report. The reply was there was no fault to find; that they were only making a report of conditions where they could find fault.

The CHAIRMAN. Speaking of the American Bridge Co., were you connected with that company for a long time?

Mr. ROBERTS. Only from May, 1900, until the spring of 1901, not quite a year.

The CHAIRMAN. You were with that company before it became a subsidiary of the United States Steel Corporation?

Mr. ROBERTS. I was president of the American Bridge Co. for about a year.

The CHAIRMAN. What was the capitalization of the company when it went into the Steel Corporation?

Mr. ROBERTS. Of the bridge company?

The CHAIRMAN. Yes, sir.

Mr. ROBERTS. I think it was about $60,000,000.

The CHAIRMAN. I will ask you if that company did not have at the time it went into that concern, into the Steel Corporation, a great many useless and antiquated and worthless plants that were taken in it, just to get all the bridge company plants into the corporation?

Mr. ROBERTS. No. There were a number of small plants—some small plants which proved after they had been running for a short time to be uneconomical—and by taking two or three of those small plants and concentrating them at one point we could produce more economical results, and that was done.

The CHAIRMAN. What would you call a small plant? What would be its tonnage per year?

Mr. ROBERTS. A small plant might employ 40 or 60 men.

The CHAIRMAN. What would be its tonnage?

Mr. ROBERTS. It might run from 500 tons to 1,000 tons. The output of a bridge plants depends very much upon the character of work it does.

The CHAIRMAN. Suppose it had a tonnage of 10,000 tons. Would that be a small plant or a large one?

Mr. ROBERTS. That would not be a large plant, no.

The CHAIRMAN. What would you call a large plant; how much tonnage?

Mr. ROBERTS. 100,000 or 125,000 tons a year.

The CHAIRMAN. Do you know anything about the plant at Albany, N. Y., built in 1880?

Mr. ROBERTS. I do know of it, yes.

The CHAIRMAN. What sort of a plant was that?

Mr. ROBERTS. It had come to a point where it was either necessary to rebuild the buildings, or abandon the plant.

The CHAIRMAN. Was that a superannuated plant?

Mr. ROBERTS. It was an old plant.

The CHAIRMAN. Do you know what amount went into the Steel Corporation?

Mr. ROBERTS. I did not; about the early formation of the bridge company I know nothing.

The CHAIRMAN. Do you know the Athens Plant, at Athens, N. Y.?

Mr. ROBERTS. Yes.

The CHAIRMAN. What sort of a plant was that?

Mr. ROBERTS. It was one of the most active plants at one time.

The CHAIRMAN. What sort of a plant was it at the time it went into the steel corporation?

Mr. ROBERTS. It was a plant that had reached a good old age. It had not been kept up to modern requirements. It either should be rebuilt or merged with someone else.

The CHAIRMAN. When was it merged——

Mr. ROBERTS (interposing). It was merged with the Elmira plant subsequent to my leaving the plant.

The CHAIRMAN. When was it merged into the American Bridge Co.?

Mr. ROBERTS. On the formation of the American Bridge Co.

The CHAIRMAN. What time was that?

Mr. ROBERTS. It was in 1900.

The CHAIRMAN. How did they happen to take in this superannuated old plant?

Mr. ROBERTS. Because at that time the President of the plant was one of the oldest and best known bridge engineers in the United States. That was Mr. Charles McDonald. He was the president of that company. They had a valuable business, a valuable railroad business, and the plant could have continued as it was. But I always believed that the necessity for forming the American Bridge Co. was to consolidate a number of these small plants, which were not economical operating units at all, but by concentration could be made so.

The CHAIRMAN. Was it made economic by concentration?

Mr. ROBERTS. I think it was.

The CHAIRMAN. How did it operate? Was not that plant dismantled and abandoned shortly after forming the American Bridge Co.?

Mr. ROBERTS. A new plant was built, and those plants were concentrated at Elmira.

The CHAIRMAN. Do you know anything about the Berlin plant at East Berlin, Conn.?

Mr. ROBERTS. I do. It is a small plant making what was known in New England as fireproof buildings.

The CHAIRMAN. How did it happen to be taken into the American Bridge Co. in 1900? It was built in 1869.

Mr. ROBERTS. It was an up to date plant, the Berlin plant, and had been kept up to date.

The CHAIRMAN. An up-to-date plant yet.

Mr. ROBERTS. I think that plant is not in operation.

The CHAIRMAN. No sir; it is not; it is abandoned.

Mr. ROBERTS. Because the character of work that was done proved unprofitable, it was abandoned by the American Bridge Co. The American Bridge Co. abandoned that class of work.

The CHAIRMAN. Before or after the American Bridge Co. went into the Steel Corporation?

Mr. ROBERTS. It practically abandoned it before it went in.

The CHAIRMAN. Was it not abandoned in March, 1909?

Mr. ROBERTS. I think prior to that; long before that.

The CHAIRMAN. That is the report given me by the United States Steel Corporation.

Mr. REED. Probably that is the date of dismantlement.

The CHAIRMAN. The date of abandonment?

Mr. REED. That is probably what it means.

Mr. ROBERTS. That is not the date at which it ceased to operate.

The CHAIRMAN. Do you know anything about the Horseheads plant, at Horseheads, N. Y.?

Mr. ROBERTS. I do not think I do.

The CHAIRMAN. Do you know anything about the Groton plant, at Groton, N. Y.?

Mr. ROBERTS. Yes.

The CHAIRMAN. That was taken in, in 1900, into this combination of structural companies?

Mr. ROBERTS. Yes. It was a very small highway concern. One of the very first things I believe it was necessary to do when I took the

management of the American Bridge Co. was to abandon all highway-bridge work, for I came to the conclusion if we did not we would either be in jail or some place else.

The CHAIRMAN. Do you know anything about the Rochester plant, at Rochester, N. Y.?

Did it not also build steel buildings and engage in erecting steel?

Mr. ROBERTS. Which?

The CHAIRMAN. The Groton plant.

Mr. ROBERTS. It built what I would term light fireproof buildings; it had a great deal of sheet-iron work and a great deal of light work. They were not what I would call skeleton buildings, office buildings, or that type, but very light work.

The CHAIRMAN. Take the Keystone plant, at Pittsburgh, Pa.; what sort of a plant was that?

Mr. ROBERTS. That was the structural department of the Carnegie Steel Co.

The CHAIRMAN. Was that a very good plant when you took it in the American Bridge Co.?

Mr. ROBERTS. It was a plant in full operation, with the Carnegie influence behind it. It was part of a system of plants.

The CHAIRMAN. It had a tonnage of 48,200 tons, I believe?

Mr. ROBERTS. Yes.

The CHAIRMAN. It was a pretty good plant?

Mr. ROBERTS. Yes.

The CHAIRMAN. Up to date?

Mr. ROBERTS. Fairly so.

The CHAIRMAN. Is it running now?

Mr. ROBERTS. No.

The CHAIRMAN. What stopped it?

Mr. ROBERTS. We concentrated all the Pittsburgh plants in one new operation at Ambridge, Pa., just within the Pittsburgh limits. We have a number of plants. The Schifler, the Walker, and a number of those plants. We believed we could do better in building a new plant, and taking what machinery there was of value from these, all of them being rendered more or less out of date by the new methods introduced by electrically driven tools. We built a new plant at Ambridge, and spent some millions of dollars in doing so.

The CHAIRMAN. Do you know anything about the Pittsburgh plant, at Pittsburgh, Pa?

Mr. ROBERTS. That was one of the Pittsburgh plants I know of.

The CHAIRMAN. It was also abandoned.

Mr. ROBERTS. Some of those plants, bear in mind, have not been abandoned. They have been substituted to other purposes than those which they originally were used for.

The CHAIRMAN. How about the Youngstown plant, at Youngstown, Ohio?

Mr. Roberts. That is a good, modern plant, I believe.

The CHAIRMAN. It was taken into the American Bridge Co.?

Mr. ROBERTS. Yes.

The CHAIRMAN. Did it do good work?

Mr. ROBERTS. You mean prior to being taken in?

The CHAIRMAN. Yes, sir.

Mr. ROBERTS. Or afterwards?

The CHAIRMAN. Was it an efficient, valuable plant, when you took it in?

Mr. Roberts. I think so.

The CHAIRMAN. Are there any other plants around Youngstown that you could concentrate it with, to advantage?

Mr. ROBERTS. I can not say from memory in regard to that. I would have to look into it.

The CHAIRMAN. Why did you abandon it, in 1904?

Mr. ROBERTS. I was not connected with the bridge company in 1904.

Mr. REED. Youngstown is only 40 miles from Ambridge, anyway, Mr. Chairman.

The CHAIRMAN. Do you know anything about the Buffalo plant, at Buffalo, N. Y?

Mr. ROBERTS. No. I think you are probably asking me questions which occurred during the time I had no connection with the company.

The CHAIRMAN. How about the Columbus plant at Columbus, Ohio?

Mr. ROBERTS. I can only say——

The CHAIRMAN (interrupting). It was a good company at the time it was taken in?

Mr. ROBERTS. I can only say the policy of the company, which rendered the company possible in the start, was one of consolidation and elimination of a number of small, economical units. That was their purpose when they came together. The formation which led up to the American Bridge Co. was on the part of these small independent units, who neither had sufficient capital to operate nor a sufficient capacity. They decided the only thing they could do would be to consolidate, to reduce the number of their plants, and make economical units.

The CHAIRMAN. How about the Lafayette Plant, at Lafayette, Ind.?

Mr. ROBERTS. I can say the same thing of that.

The CHAIRMAN. Was it a good plant?

Mr. ROBERTS. Light highway work mostly.

The CHAIRMAN. That was taken into the American Bridge Co.?

Mr. ROBERTS. It was.

The CHAIRMAN. Was it a bridge company any length of time thereafter?

Mr. ROBERTS. I can not answer that question; I do not remember.

The CHAIRMAN. The report says it was abandoned in 1904.

Mr. ROBERTS. You can see the difference in sizes when I say the company which I was connected with, the Pencoyd Works, had a capacity in its bridge shop at that time of over 100,000 tons a year. If you wanted to make an economical unit, you had to do it, and these men joined together for that purpose. It was never intended not to reduce the number of those plants and to consolidate them.

The CHAIRMAN. Do you know anything about the Shultz plant?

Mr. ROBERTS. That was a plant at Pittsburgh.

The CHAIRMAN. Yes, McKees Rocks, Pa. Was it a pretty good plant?

Mr. ROBERTS. The type of work it did was light work.

The CHAIRMAN. And the Milwaukee plant, at Milwaukee, Wis.

Mr. ROBERTS. That was a miscellaneous work; I do not know much about it. I never saw it.

The CHAIRMAN. Now, is it true that you sell finishing material to the American Bridge Co. at lower prices than you charge independent companies for the same character of material?

Mr. REED. What do you mean by "you"?

The CHAIRMAN. I mean the Steel Corporation, in its intercorporate sales.

Mr. ROBERTS. The Steel Corporation does not sell anything.

The CHAIRMAN. Do not the subsidiary companies make such stuff, such material as the bridge company uses? It does not make it from the blast furnaces, as I understand. Do you sell that at the same price to another company as you would to a subsidiary company? Do you sell to the subsidiary companies at the same price you sell to independents? Do you catch my question?

Mr. ROBERTS. What you mean is——

The CHAIRMAN (interposing). What I mean is this: The American Bridge Co. does not operate blast furnaces nor does it make angles.

Mr. ROBERTS. It makes angles.

The CHAIRMAN. They are like the Carnegie Co.

Mr. ROBERTS. There are some sizes sold by the Carnegie Co. to it. Some sizes are sold to it by various subsidiary companies. It makes its own steel as well.

The CHAIRMAN. Does the Carnegie Co. sell to the American Bridge Co. at the same price as to independents?

Mr. ROBERTS. It sells at market rates.

The CHAIRMAN. What do you mean by market rates?

Mr. ROBERTS. Market rates.

The CHAIRMAN. Does it not sell to the American Bridge Co. for less?

Mr. ROBERTS. Why should it? No. It sells at market rates. All intercompany business between the subsidiary companies and the United States Steel are at market rates.

The CHAIRMAN. That is, if the Carnegie Co. has an order for structural material from the American Bridge Co. and it has a similar order, we will say, from Milliken Bros., before that concern went out of business—it would be sold to the American Bridge Co. and to Milliken, the same material, for the same price.

Mr. ROBERTS. At the same market rates.

The CHAIRMAN. Would they be charged the same prices?

Mr. ROBERTS. I can not tell you that. It would be the same market rates. There are no absolute fixed prices in the steel business. That has been one of the misunderstood things.

The CHAIRMAN. But I am not asking about that. Suppose the American Bridge Co. wanted a certain number of girders of certain dimensions and a certain number of I beams of various dimensions, and Milliken Bros. wanted the same identical material, at the same time?

Mr. ROBERTS. Yes.

The CHAIRMAN. Would you have gotten the same amount of money from the American Bridge Co. that you did from Milliken Bros., for the same identical thing?

Mr. ROBERTS. I think so. Probably the American Bridge Co., if it had gone out into the open market, to Jones & Laughlin, for instance,

or some one else, would have bought it cheaper than it bought it from the Carnegie Steel Co.

The CHAIRMAN. Does the American Bridge Co. or the United States Steel Corporation stand the freight on the finished bridge and structural steel, from the point of manufacture to destination?

Mr. ROBERTS. How is that?

The CHAIRMAN. Does the American Bridge Co. or the United States Steel Corporation stand the freight on the finished bridge and structural steel, from the point of manufacture to destination?

Mr. ROBERTS. It depends entirely upon the terms of the contract whether it is f. o. b. works or f. o. b. destination.

The CHAIRMAN. What is your custom?

Mr. ROBERTS. It varies with each individual contract.

The CHAIRMAN. But you do make contracts by which you pay the freight?

Mr. ROBERTS. Oh, all the time.

Mr. BARTLETT. I want to inquire about that. Is that done with a view of discriminating between purchasers?

Mr. ROBERTS. No. It depends upon the nature of your contract. The inquiry may come——

Mr. BARTLETT (interposing). In order to get the business?

Mr. ROBERTS. No, sir. The inquiry may come for the price of structural material f. o. b. cars, works; from another party it may come for a price f. o. b. cars, for instance, delivered at Philadelphia or Washington, D. C.; from another party it may be for the price per pound for structural work erected in place, set up. No two contracts are the same in that respect.

Mr. BARTLETT. If you got a contract for delivery f. o. b. at your works, and one f. o. b. destination, you add the freight?

Mr. ROBERTS. We add freight; that is all.

The CHAIRMAN. You were a director of this concern. Can you tell what per cent of the structural steel business you had at the time of the formation of this concern?

Mr. ROBERTS. I think I gave testimony as to that in my previous examination.

The CHAIRMAN. I do not recall it.

Mr. ROBERTS. I would refer to it. I do not want off-hand to make a mistake. My impression is it was less than 50 per cent.

The CHAIRMAN. I think so.

Mr. ROBERTS. Of the entire output.

The CHAIRMAN. Did you have any real active competition at that time?

Mr. ROBERTS. Oh, yes.

The CHAIRMAN. Who were your principal competitors at that time?

Mr. ROBERTS. There was the Phoenix Co., the Pennsylvania Steel Co., the McClintock-Marshall Co. plants at Pittsburgh and Pottstown, Milliken Bros. They are innumerable. I could give you a list of 100 or more of them.

The CHAIRMAN. You had very active competition at the time of the formation of this American Bridge Co.?

Mr. ROBERTS. Yes. The Carnegie Steel Co. was another competitor.

The CHAIRMAN. I mean at the time of the formation of the United States Steel Corporation.

Mr. ROBERTS. I thought you were speaking about the American Bridge Co.

The CHAIRMAN. Oh, no.

Mr. ROBERTS. Now, I was speaking of the year 1900, and you are speaking of 1901.

The CHAIRMAN. Outside of those you have given, who are the principal competitors that did not go in?

Mr. ROBERTS. Those are the ones I have been naming.

The CHAIRMAN. They did not go into the Steel Corporation?

Mr. ROBERTS. They did not go into the American Bridge Co. or the Steel Corporation.

The CHAIRMAN. How did the per cent of that business, as controlled by the United States Steel Corporation at the time of its formation, compare with the per cent of the tin-plate business, we will say.

Mr. ROBERTS. It had a greater per cent of the tin-plate business than it had of the structural business.

The CHAIRMAN. How about the American steel and wire business?

Mr. ROBERTS. It had a greater percentage of the steel and wire business than it had of the structural business.

The CHAIRMAN. How about the rail business?

Mr. ROBERTS. That I am not prepared, offhand, to say.

Mr. CHAIRMAN. What is your opinion?

Mr. REED. These figures are all in evidence.

The CHAIRMAN. I do not recall it. He will probably recall.

Mr. REED. I can give them to you.

The CHAIRMAN. Go ahead.

Mr. REED. In 1901——

Mr. BARTLETT. What page?

Mr. REED. Page 365 of Mr. Herbert Knox Smith's report.

Mr. ROBERTS. The original figures, at the time of the formation, were given to the committee, I think in Judge Gary's testimony.

The CHAIRMAN. You had a greater per cent, I believe of coated-tin mill products, and a greater per cent of black and coated sheets and wire rods, and wire nails, wrought pipe and tubes, and seamless tubes. Were there any businesses in which you had a less per cent of the output, to amount to anything, than of the structural steel?

Mr. REED. Pig iron for one.

The CHAIRMAN. What else?

Mr. REED. I do not think of any others at this minute.

The CHAIRMAN. You were a purchaser of pig iron, were you not?

Mr. ROBERTS. The American Bridge Co. was a purchaser of pig iron, yes.

The CHAIRMAN. It was the policy of the Steel Corporation at the time of its formation to keep the price of pig iron stable, was it not?

Mr. ROBERTS. It was a large purchaser of pig iron at the time of its formation.

The CHAIRMAN. Did it not form for the purpose of maintaining stable prices.

Mr. ROBERTS. No, it——

The CHAIRMAN (interposing). My recollection is that the statement occurs in the minutes of the Steel Corporation, or that it is stated in the minutes of the Carnegie Co., that its policy, or the policy of the

United States Steel Corporation, was to prevent fluctuations in price of pig iron and to obtain a stable price.

Mr. ROBERTS. I think the policy of the Steel Corporation throughout has been to maintain stable prices.

The CHAIRMAN. In pig iron?

Mr. ROBERTS. In anything; all output.

The CHAIRMAN. How many of those concerns that were competitors of yours at that time are now competitors, who were at the time of the formation of the United States Steel Corporation?

Mr. ROBERTS. I do not follow you clearly in the term "you," and so on.

The CHAIRMAN. I beg your pardon. What per cent of the makers of structural steel who were in the business at the time the Steel Corporation was formed, are in the business now?

Mr. ROBERTS. They are all in the business, and in addition a good many more.

The CHAIRMAN. Are Milliken Bros. in the business?

Mr. ROBERTS. They are being operated by receivers.

The CHAIRMAN. How many of them are operated by receivers?

Mr. ROBERTS. Milliken Bros. are operated by receivers. They are the only ones I know of in that condition. I hope there will not be more. But the number of independents have increased. I saw a list recently which showed, I think, that the independent structural plants had increased in 10 years from some 200 to some 400. The percentage which the Steel Corporation's structural shops now bear to the whole is about 30 per cent of the structural business of the country to-day.

The CHAIRMAN. You have 30 per cent to-day?

Mr. ROBERTS. Yes.

The CHAIRMAN. Have you Herbert Knox Smith's figures there?

Mr. REED. Of course you understand in the manufacture of structural shapes——

Mr. ROBERTS (interposing). Not structural shapes; fabricated structural material.

The CHAIRMAN. I mean the American Bridge Co.'s structural material for erecting buildings.

Mr. ROBERTS. That is what I understand.

Mr. YOUNG. The last year Mr. Smith gives the structural shapes is 1909.

Mr. ROBERTS. That is another matter. That is the structural shape before fabrication—angles, beams, and so on.

The CHAIRMAN. Has this American Bridge Co., since it went into the Steel Corporation, done a profitable business?

Mr. ROBERTS. I can not answer that question, Mr. Chairman. I have never seen the figures.

The CHAIRMAN. Have you those figures up to the present, Mr. Reed?

Mr. REED. I have the figures for 1911, as stated in the Steel Corporation's answer in the dissolution suit. At the present time the competitors of the American Bridge Co. produce 70 per cent of bridge and structural steel work fabricated in the United States.

Mr. ROBERTS. That was my impression.

The CHAIRMAN I know there was very sharp competition.

Mr. ROBERTS. Mr. Chairman, just while you are there, it may be interesting on the subject of structural material to look over this diagram I have here showing the price of plate girder bridges for 10 years prior to 1900 and 10 years subsequent to 1900, and also the wages paid in bridge shops during that time. If we take the year 1900 as a basis, the wages in bridge shops paid have increased 35 per cent, and the selling price of plate girder bridges has been reduced 32 per cent. If they get apart much farther there is going to be trouble pretty soon.

The CHAIRMAN. I did not quite catch that.

Mr. ROBERTS. Here is a diagram showing the wages paid the employees of bridge shops, structural shops, from the year 1890 to 1910; also the price of the material which composes plate-girder bridges, and the selling price of plate-girder bridges.

The wages have advanced since 1900 35 per cent per day, whereas the selling price of plate-girder bridges has been reduced 32 per cent. They are getting farther apart, and I do not know which is going out of sight first.

The CHAIRMAN. I quite agree with you. Now, you are selling structural shapes at a very much less price than you did in 1900. That is, at a very much less profit.

Mr. ROBERTS. Oh, profit?

The CHAIRMAN. Yes.

Mr. ROBERTS. I think that is the case.

The CHAIRMAN. Here is a condition of affairs that appears interesting to me. Perhaps you can explain it. The dividends received by the United States Steel Corporation on the preferred stock of the American Bridge Co. for the last 10 years was $19,715,577.50, as shown by the books of the company, furnished me by Mr. McRae. The total dividends and interest of the Carnegie bonds received by the United States Steel Corporation for the same time were $763,124,386.53, which gives 2.6 per cent profit for the American Bridge Co. during that period, which is a very low profit.

Can you account, for me, for the very small amount of the earnings of the American Bridge Co. during the last 10 years? Why it is that this company is earning practically nothing?

Mr. ROBERTS. One reason, I might say, probably, would be the very full current rates it has been compelled to pay for its material, to the other subsidiary companies.

The CHAIRMAN. The high price of the raw material?

Mr. ROBERTS. The full market rates for raw material. In other words, it is not purchased in the open market in competition.

The other reason would be that it has had a very fierce competition with outsiders throughout that entire time.

I can not offhand think of anything else.

The CHAIRMAN. The price of material from which structural shapes are fabricated is so near the selling price of structural shapes there is no profit in it. Do I understand you that way?

Mr. ROBERTS. The profit is low.

The CHAIRMAN. That is, because of the lack of profit.

Mr. YOUNG. About $1,900,000 a year was the average.

Mr. ROBERTS. About $2,000,000 a year?

Mr. YOUNG. I say, $1,900,000.

Mr. ROBERTS. Yes.

The CHAIRMAN. Yes, about that.

Mr. YOUNG. It averages a trifle less than $2,000,000 a year.

Mr. REED. When you started on this line of inquiry Mr. Roberts was about to take up this "old age at 40" business. Do you want to hear from him on that?

The CHAIRMAN. Yes. I beg pardon for interrupting you, Mr. Roberts. I had a memorandum here about this American Bridge Co., and I was afraid I would forget it, so I "butted in."

Mr. ROBERTS. I had been giving you some information with regard to hours of labor and number of turns per week.

I now would like to offer you some statements in regard to "old age at 40." I have here photographs representing 761 men employed in the various departments of the Carnegie Steel Co., both blast furnaces and steel works.

Here is a group of blast-furnace men at those blast furnaces.

Mr. BARTLETT. Mr. Roberts, will you suspend just a moment? I would like to hear what you are about to say, but there is a Democratic caucus called to meet when the House adjourns. Some of us will have to go.

The CHAIRMAN. I will remain, if you prefer to go on.

Mr. ROBERTS. I will be glad to be at your disposal.

Mr. REED. I think Mr. Roberts would like to have all of the committee hear what he has to say.

The CHAIRMAN. We can adjourn until later this evening, or until to-morrow morning.

Mr. ROBERTS. I am entirely at the service of the committee.

The CHAIRMAN. Very well. The committee will stand adjourned until to-morrow at 10.30 o'clock.

Thereupon at 4.20 o'clock p. m., the committee adjourned until to-morrow, Thursday, February 15, 1912, at 10.30 o'clock a. m.

[Private telegraph service—confirmation.]

CARNEGIE STEEL CO., *February 8, 1912.*

To Mr. C. L. CLOSE,
New York, N. Y.

Your 268. Open hearths start Sunday morning.

No. 1 O. H., 96 per cent men start from 9 a. m. to 12 m., 4 per cent men start from 3 to 6 p. m.

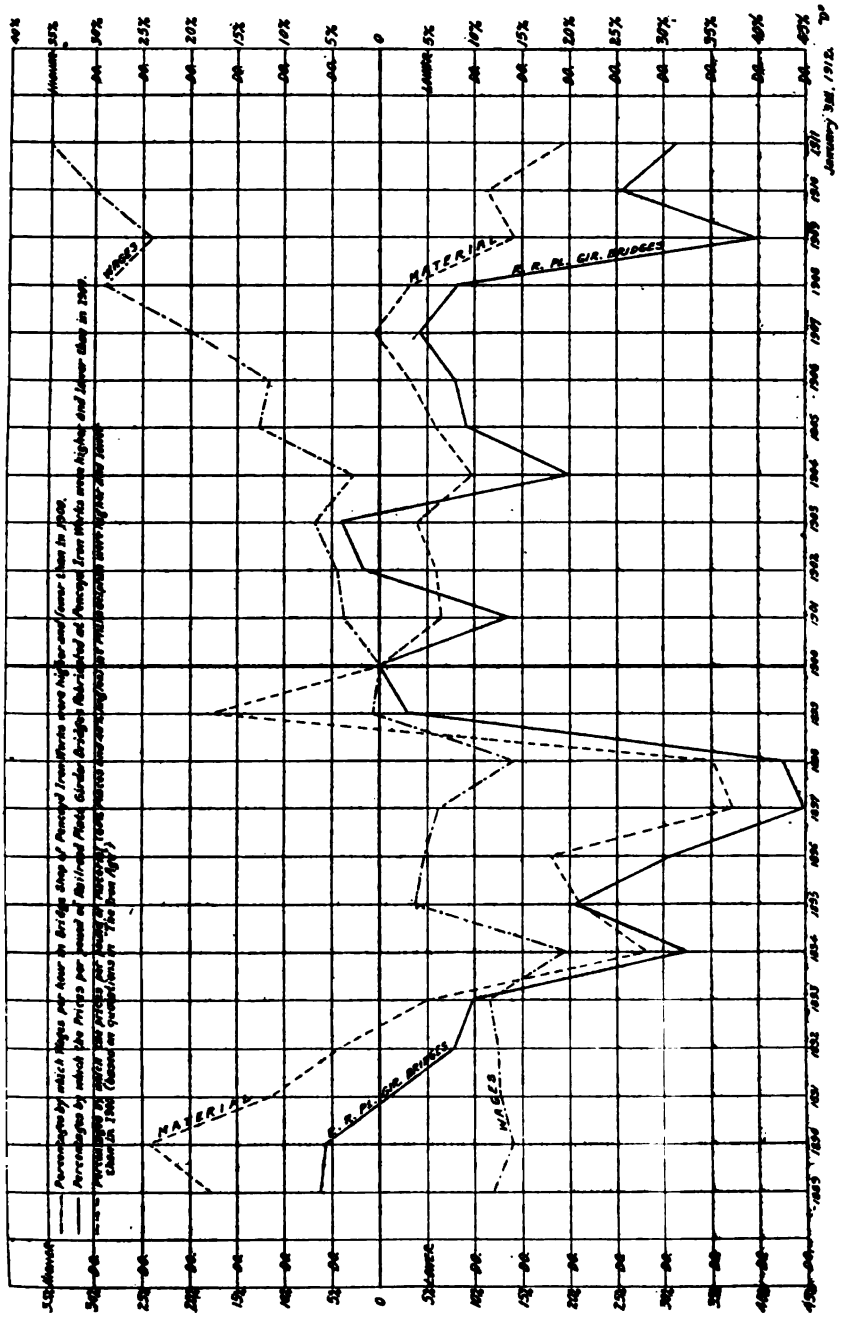
No. 2 O. H., 55 per cent men start from 9 a. m. to 12 m., 22 per cent men start from 3 to 6 p. m.; 23 per cent men start 6 p. m.

No. 3 O. H., 66 per cent men start from 9 a. m., to 12 m., 8 per cent men start from 3 to 6 p. m., 26 per cent men start 6 p. m.

No. 4 O. H., 74 per cent men start from 9 a. m. to 12 m., 10 per cent men start from 3 to 6 p. m., 16 per cent men start 6 p. m.

Weekly turn ends in all O. H. departments anywhere from 9 a. m. to 6 p. m. on Saturday. All other departments start 6 p. m. on Sunday and finish before 6 p. m. on Saturday. Twelve hours constitute a day's work, which men divide up to suit themselves. Common labor rate, 17½ cents per hour; 10 and 12 hours per day. Average daily earnings No. 1, $2.78; No. 2, $2.91; No. 3, $3.31; No. 4, $3.12; 28-inch mill, $2.64; 38-inch mill, $2.70; 23-inch mill, $2.70; 33-inch mill, $2.79; 128-inch mill, $3.02; 140-inch mill, $2.83.

(Signed) G. K. PRESTON.


WAGES
MATERIALS
R. R. PL. GIR. BRIDGES
MATERIALS
R. R. PL. GIR. BRIDGES
WAGES

[Private telegraph service—telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

G. K. PRESTON, *Special Agent, Carnegie Steel Co.,*
Carnegie Building, Pittsburgh, Pa.

Will you please send me to-day, if possible, the time of day for starting and stopping weekly turns, separately, in the following Homestead works: Open hearth, 1, 2, 3, and 4; 23-inch mill; 33-inch mill; 140-inch plate mill; 128-inch plate mill; 38-inch blooming mill; 28-inch blooming mill. Would like number of hours constituting days' work; the common labor wage and the average daily earnings for these departments based on month of October or some other representative month.

C. L. CLOSE.

[Telegram.]

UNITED STATES STEEL CORPORATION,
246] *Pittsburgh, February 7, 1912—4.19 p. m.*

C. L. CLOSE: Impossible to give you information this evening. Will wire as soon as possible to-morrow.

G. K. PRESTON.

[Private telegraph service—Telegram.]

140] UNITED STATES STEEL CORPORATION,
Pittsburgh, February 9, 1912—2.44 p. m.

C. L. CLOSE:

Your 167. Statistics compiled some time ago, show that 6 per cent of our men work 8 hours, 35 per cent 10 hours, 5 per cent 11 hours, 53 per cent 12 hours, and 1 per cent 13 hours. Auditor Campbell gave W. J. Filbert this information on March 1, 1911.

G. K. PRESTON.

A. C. Dinkey, President.

CARNEGIE STEEL CO.,
GENERAL OFFICES, CARNEGIE BUILDING,
Pittsburgh, Pa., September 14, 1911.

Mr. J. A. FARRELL, *President, United States Steel Corporation,*
New York City, N. Y.

DEAR SIR: As per your request of August 31 for information regarding average hours of rest and active labor for different classes of employees, I inclose herewith statement showing the per cent of time actually worked by men working on 12-hour turns.

These figures were taken by practical men on the ground with a stop watch, keeping the time only when the employees were actually employed performing the duties incident to their occupation.

I also inclose details of some of the occupations in the open-hearth department, showing just what the men do and the length of time employed on each item. We do not have details on the occupations at blast furnaces or rolling mills, but will make an effort to secure the same.

I attach a statement showing six-day labor plan at the blast furnaces; also a statement showing percentage of men working six and seven days per week at one of our plants—this latter statement taken during the last two weeks in August.

I am sending you under separate cover a set of photographs, taken at our various departments, of men over 40 years of age, and of over 20 years of service, which, I think, will give you a better idea of the condition of our men than could be set up in any statement we could prepare.

Yours, truly,

A. C. DINKEY, *President.*

	Per cent of time worked.
Blast-furnace department:	
Keeper	54.0
First helper	51.0
Second helper	51.5
Clayman	50.0
Hot-blast man	26.0
Cinder snappers (average of 3)	53.0
Average	47.6
Open-hearth department:	
First helper	34.3
Second helper	63.3
Cinder pitman	40.5
Charging machineman	32.5
Hot-metal craneman	32.5
Average	40.6
Forty-inch bloom mill:	
Roller	40.0
Leverman No. 1	51.3
Leverman No. 2	50.0
Heater	26.0
Soaking-pit craneman	64.4
Average	46.3
Eighteen-inch bar mill:	
Roller	73.0
Guide setter	61.7
Rougher	75.0
Intermediate	80.0
Finisher	78.8
Hot-bed leverman	76.0
Craneman	61.3
Average	72.3
Fourteen-inch bar mill:	
Roller	65.7
Guide setter	52.5
Rougher	86.4
Finisher	83.7
Craneman	60.0
Transfer leverman	73.4
Hot-bed leverman	78.3
Average	71.5
Twenty-two inch mill, No. 1:	
Roller	34.0
Guide setter	40.0
Guide setter	42.0
Rougher	80.0
Finisher	79.0
Craneman	51.0
Average	54.3
Twenty-two-inch mill No. 2:	
Roller	28.5
Guide setter	23.0
Do	32.0
Rougher	65.0
Finisher	63.0
Transfer Leverman	63.0
Craneman	60.0
Average	47.8

Steel pourer and crew, actual working time Aug. 9, 1911.

	H.	m.
Steel pourer working heats	1	24
Cleaning up	1	32
Actual time worked	2	56
First man working heats	1	29
Cleaning up	1	35
Actual time worked	3	4
Pusher man working heats	1	29
Cleaning up	1	42
Actual time worked	3	11

Steel craneman, actual working time, Aug. 9, 1911.

Time working heats	1	15
Time loading scrap and cinder	2	7
Time on ladle	0	46
Oiling and cleaning crane	1	5
Actual time worked	5	13

Check from 6 a. m. to 6 p. m.

Hot-metal craneman, actual working time, Aug. 10, 1911.

M. M. to furnace	3	41
Oiling crane	0	49
Dumping dolomite	0	52
Actual time worked	5	22

Charging machine man's actual working time, Aug. 10, 1911.

Time charging heats	4	6
Time oiling crane	0	20
Actual time worked	4	26

Stripper man's actual working time, Aug. 11, 1911.

First man's actual time worked	2	54
Second man's actual time worked	2	55

Check from 6 a. m. to 6 p. m.

No. 38 furnace, Aug. 4, 1911.

First helper's actual working time:		
Reversing and examining furnace	1	2
Making bottoms	0	20
Working heat	0	25
Taking tests	0	13
On hunch hole	0	8
Tapping heat	0	10
Banking doors	0	6
Help rabble on No. 37 furnace	0	25
Actual time worked	2	49

Second helper's actual working time:	H.	m.
Getting stock for heat	2	10
Tapping heat	0	10
Working heat	0	11
Taking tests	0	15
Tapping hole	0	20
Making bottom	0	15
Cleaning up	0	55
On spout	1	30
Actual time worked	5	46

No. 47 furnace, Aug. 7, 1911.

Cinder pitman actual working time:		
On cinder pit	1	2
On tapping hole	0	9
On tapping heats	0	48
On making bottoms	0	45
Shoveling manganese in ladle	0	2
Cleaning up	0	18
Actual time worked	3	4

Stopper setter and crew, actual working time.

Stopper setter actual time worked	3	5
First helper actual working time	3	39
Second helper actual working time	3	24
Extra men getting stoppers, loam, and cleaning up	3	48

Check from 6 a. m. to 6 p. m.

Stopper setter and crew, July 26, 1911.

Stopper setter actual time worked on ladles	3	42
First helper actual time worked	5	51
Second helper actual time worked	5	10

Check from 6 a. m. to 6 p. m.

Stripperman actual working time, July 27, 1911.

Stripping heats	3	46
Oiling stripper	0	26
Actual time worked	4	12

Hot metal craneman's actual working time, July 28, 1911.

Hot metal to furnaces	6	26
Oiling crane	1	27
Actual time worked	7	53

Charging machine man's actual working time, July 28, 1911.

Charging heats	3	6

Check from 6 a. m. to 6 p. m.

Steel pourer and crew, July 21, 1911.

Time pouring heats	2	22
Time cleaning up	1	24
Actual time worked, steel pourer	3	46

	H.	m.
First man:		
Time working heats	2	25
Time cleaning up	1	16
Actual time worked	3	41
Pusher man:		
Time working heat	2	22
Time cleaning up	1	16
Actual time worked	3	38

No. 57 furnace, July 24, 1911.

First helper, actual working time:		
Reversing and examining furnace	1	9
Making bottom	0	22
Working heat	0	35
Taking tests	0	13
On hunch hole	0	18
Tapping heat	0	13
Banking doors	0	5
On ports	1	35
Actual time worked	4	30
Second helper:		
Time on spout	1	13
Time cleaning up	1	8
Time getting stock for heat	2	34
Time taking tests	0	13
Time on tapping hole	0	14
Time on tapping heat	0	13
Time working heat	0	27
Actual time worked	6	2

Check from 6 a. m. to 6 p. m.

No. 64 furnace, July 25, 1911.

Cinder pitman's actual working time:		
Tapping hole	0	22
Tapping heats	0	50
Making bottoms	1	18
Shoveling manganese in ladle	0	7
On cinder pit	0	48
Cleaning up	0	22
Actual time worked	3	47

Steel craneman, July 21, 1911.

Working heats	3	8
Loading scrap and cinder	2	13
On ladles	1	45
Oiling crane	0	40
Repairing crane	0	45
Actual time worked	8	31

Check from 6 a. m. to 6 p. m.

Carnegie Steel Co., Homestead Steel Works.

	H. m.
Steel works:	
Men, average force	7,110
Worked 7 days (3.4 per cent)	240
Men not working 7 days (96.6 per cent)	6,870
Men, average force, not including hospital and police	7,075
Worked 7 days (2.7 per cent)	205
Men not working 7 days (97.3 per cent)	6,870
Blast furnaces:	
Men, average force	975
Worked 7 days (8 per cent)	77
Men not working 7 days (92 per cent)	898
Men, average force, not including hospital and police	966
Worked 7 days (7.6 per cent)	68
Men not working 7 days (92.4 per cent)	898

3.4 per cent men working 7 days, not including hospital and police.

Name of plant, Clairton; period shown, April and May, 1911.

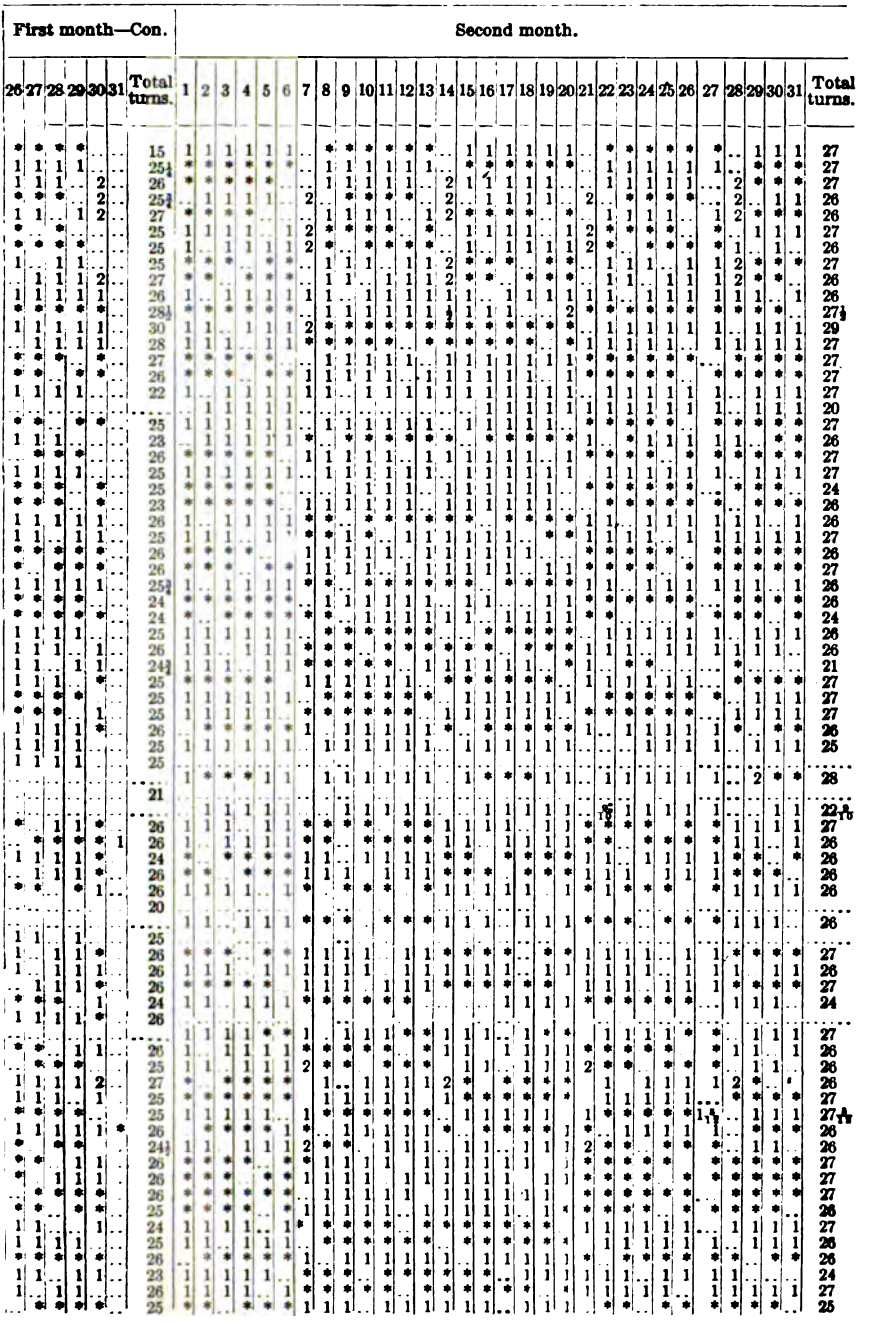
Carnegie Steel Co. blast-furnace labor—Time worked by men

[Figure 1 denotes day turn, * denotes night turn.]

Check No.	Occupation at which engaged greater part of the 2 months' period.	First month.																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
2311	Blowing room	*	..	1	1	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	*	*
2053	First engineer	1	..	*	*	*	*	*	*	..	1½	1	1	1	1	1	..	*	*	*	*	*	*	..	1	1
2045	Blowing room	..	2	*	*	*	*	*	..	..	1	1	1	1	1	..	2	*	*	*	*	*	..	..	1	1
2074	Second engineer	..	2	..	1	1	1	1	..	2	2	*	*	*	*	*	*	..	1	1	1	1	1	*	..	..
2091	Blow-room oiler	1	2	*	*	*	*	..	*	..	1	1	1	1	..	1	2	*	*	*	*	..	*	..	1	1
2325	.....do	*	1	1	1	1	..	1	2	*	*	*	*	..	*	..	1	1	1	1	..	1	2	*	*	*
2399	.....do	*	..	1	..	1	1	1	1	2	*	..	*	*	*	*	..	1	..	1	1	1	1	2	*	..
2111	.....do	1	2	*	*	*	..	*	*	..	1	1	1	1	..	2	*	*	*	..	*	*	..	..	1	1
2251	.....do	1	2	*	*	..	*	*	*	..	1	1	..	1	1	2	*	*	..	*	*	*	..	..	1	1
2041	Oil carrier	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..
2141	Assistant blower	*	*	*	*	*	*	*	*	..	1	1	1	1	1	1	1	1	1	1	1	1	..	2	*	*
2143	.....do	1	1	1	1	1	1	1	1	2	*	*	*	*	*	*	*	*	*	*	*	*	*	..	1	1
2232	Stove tenders	*	*	*	*	*	*	*	*	1	..	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2132	.....do	*	*	*	*	..	*	*	*	1	1	1	..	1	1	1	1	1	1	1	1	1	1	*	*	*
2302	.....do	*	*	*	..	*	*	*	*	1	1	..	1	1	1	1	1	1	1	1	1	..	1	*	*	*
2287	Stove cleaners	1	..	1	1	1	1	1	1	1	1	1	1	1	1	..	1	1	1	..	..	..	..	1	..	1
2114	.....do	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2200	Clayman	..	*	*	*	*	..	*	*	1	1	1	1	1	1	..	1	1	1	1	1	..	1	*	*	*
2349	.....do	*	..	1	1	1	1	1	*	..	*	*	*	*	*	*	..	*	*	*	*	*	*	..	..	..
2341	.....do	*	*	*	..	*	*	*	*	1	1	1	1	1	1	..	1	1	1	1	1	*	*	*	*	*
2244	Clay mixer	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1
2049	Keepers	*	*	*	..	*	*	*	*	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	*	*
2047	.....do	..	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	..	1	1	1	1	..	*	*	*
2153	.....do	1	1	1	..	1	1	1	1	*	*	..	*	*	*	*	*	*	..	*	*	*	*	1	1	..
2174	.....do	1	1	..	1	1	1	1	1	*	..	..	*	*	*	*	*	*	..	*	*	*	*	1	..	1
2154	First helpers	*	*	*	..	*	*	*	*	1	1	..	1	1	1	1	1	1	..	1	1	1	1	*	*	..
2123	.....do	*	*	*	*	*	*	..	*	1	1	1	1	..	1	1	1	1	1	1	..	1	1	*	*	*
2265	.....do	1	1	1	..	1	1	1	1	*	*	..	*	*	*	*	..	*	*	*	*	*	1	1	..	..
2262	.....do	*	*	*	*	*	..	*	*	1	1	1	1	..	1	1	1	1	1	1	1	1	1	..	..	..
2102	Second helpers	*	*	*	..	*	*	*	1	1	..	1	1	1	1	1	..	1	1	1	1	1	..	..	..	..
2162	.....do	1	1	..	1	1	1	1	*	..	*	*	*	*	*	..	*	*	*	*	*	..	1	1	..	..
2289	.....do	1	1	1	1	1	..	1	*	*	*	*	*	*	..	*	*	*	*	*	..	1	1	1	..	..
2312	.....do	1	1	..	1	..	1	1	1	*	*	*	..	*	*	*	*	*	..	*	*	1	1	1	..	..
2071	Water tender	..	*	*	*	*	*	..	1	1	1	1	1	..	*	*	*	*	*	*	*	..	1	1	1	..
2072	.....do	*	..	1	1	1	1	1	..	*	*	*	*	*	*	..	1	1	1	1	1	..	*	*	*	..
2180	.....do	..	1	1	1	1	1	..	*	*	*	*	*	*	..	1	1	1	1	1	..	*	*	*	..	..
2339	.....do	1	*	..	*	*	*	*	*	..	1	1	1	1	1	*	..	*	*	*	*	*	1	..	1	..
2240	Boiler cleaner	1	..	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	..	1	1	..	..
2388	Boiler cleaner's helper	1	..	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	..	1	1	..	..
2036	.....do	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2249	.....do	1	..	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	..	1	1	..	..
2224	.....do	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2021	Fireman	*	1	1	1	1	..	1	1	*	*	*	..	*	*	1	1	1	1	..	1	1	*	*	*	*
2392	.....do	*	1	1	..	1	1	1	1	*	*	..	*	*	*	1	1	..	1	1	1	1	*	*	*	*
2067	.....do	1	*	*	..	*	*	*	*	1	1	..	1	1	1	*	..	*	*	*	*	*	..	..	..	..
2346	.....do	1	*	*	*	..	*	*	*	1	1	1	..	1	1	*	*	*	..	*	*	..	*	1	1	1
2149	.....do	*	1	1	1	1	1	..	1	*	*	*	*	..	*	1	1	1	1	1	..	1	2	..	..	*
2383	.....do	*	1	..	1	1	1	1	1	*	..	*	*	*	*	1	..	1	1	1	1	1	*	..	..	..
2329	.....do	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2036	.....do	1	*	*	*	*	*	..	*	1	1	1	1	1	..	*	*	*	*	*	*	..	*	1	1	1
2389	.....do	1	*	*	*	*	*	..	*	1	1	1	1	..	1	*	*	*	*	*	*	..	*	1	1	1
2212	Power-house engineer	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	..	1	1	1	1	1	1	1	1
2369	.....do	1	*	*	*	*	*	*	..	1	1	1	..	1	1	*	*	*	*	*	*	*	..	1	1	1
2151	Power-house oiler	*	..	..	1	1	1	*	*	..	1	..	1	1	*	1	1	1	..	1	1	..	1	1	*	*
2122	.....do	1	*	*	*	*	..	*	1	..	1	1	1	1	*	*	*	*	*	*	..	*	1	1	..	..
2350	.....do	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2374	.....do	*	1	1	..	1	1	1	1	*	*	*	*	*	..	*	1	1	..	1	1	1	*	*	*	*
2077	Condensing engineer	*	..	1	1	..	1	*	2	*	*	..	*	*	*	..	1	1	..	1	1	1	2	*	*	*
2168	.....do	1	2	*	..	*	*	*	*	..	1	..	1	1	1	1	2	*	..	*	*	*	*	..	1	..
2037	Pump-house engineer	..	1	*	*	*	*	*	..	..	1	1	1	1	1	..	1	*	*	*	*	*	*	..	1	1
2039	.....do	*	..	1	1	1	1	1	..	1	*	*	*	*	2	..	1	1	1	1	1	..	1	*	*	*
2012	Pump-house oiler	1	*	..	*	*	*	*	1	*	..	1	1	1	2	..	*	*	..	*	*	*	*	1	*	*
2284	.....do	*	..	1	1	..	1	1	1	2	*	*	*	..	*	*	..	1	1	..	1	1	1	2	*	*
2027	Larryman	*	*	*	*	*	*	..	*	1	1	1	1	1	..	1	1	1	1	1	1	..	1	*	*	*
2163	.....do	*	*	*	*	*	*	..	*	1	1	1	1	..	1	1	1	1	1	1	..	1	1	*	*	*
2050	.....do	*	*	*	*	*	*	..	*	*	1	1	1	..	1	1	1	1	1	1	..	1	1	*	*	*
2306	Cinder snapper	*	*	*	*	*	*	..	..	1	1	1	1	1	..	1	1	1	1	1	1	1	1	*	*	*
2258	.....do	..	1	1	1	1	1	1	..	*	*	*	*	*	*	*	*	*	*	*	*	..	1	1	1	1
2227	.....do	1	..	1	1	1	1	1	1	..	*	*	*	*	*	*	*	*	*	*	*	*	*	..	1	1
2191	.....do	*	*	*	*	..	*	*	*	1	1	..	1	1	1	1	1	1	1	..	1	1	1	*	..	..
2280	.....do	1	1	1	1	1	1	..	1	*	*	*	*	*	..	*	*	..	*	*	*	..	1	..	1
2194	.....do	1	1	1	1	1	..	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	1	1	1	1
2281	.....do	*	*	*	*	..	*	*	*	1	1	1	..	1	1	1	..	1	1	1	1	..	1	*	*	*

who were on pay rolls greater part of the 2 months' period.

[Figure 1 denotes day turn, * denotes night turn.]



17042—No. 50—12——5

Carnegie Steel Co. blast-furnace labor—time worked by men who

Check No.	Occupation at which engaged greater part of the 2 months' period.	First month.																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
2078	Cinder car operator	1	*	*	*	..	*	*	*	1	1	1	..	1	1	1	*	*	*	..	*	*	*	1	1	1
2203	.....do	1	*	*	*	*	..	*	*	1	1	1	1	..	1	1	*	*	*	*	..	*	*	1	1	1
2362	.....do	1	*	*	*	..	1	1	1	*	*	*	..	*	*	*	1	1	1	..	1	..	1	*	*	*
2385	.....do	1	1	1	1	1	..	*	1	*	*	*	*	..	*	*	1	1	..	1	..	1	1	*	*	*
2031	Ladle liner	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1
2032	Ladle liner helper	1	1	1	1	1	..	1	1	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1
2256	Pig machine foreman	1	1	..	1	1	1	1	1	1	*	*	*	*	*	*	*	..	*	*	*	*	*	..	..	*
2044	.....do	*	*	..	*	*	*	*	*	..	..	1	1	1	1	1	..	..	1	1	1	1	1	2	..	1
2007	Pig machine repairman	1	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	*	*	*	*	*	*	..	1	1
2342	.....do	*	1	1	..	1	1	1	1	*	*	..	*	*	*	*	1	1	..	1	1	1	1	*	*	..
2372	First leverman	*	*	..	1	1	*	*	*	..	..	1	1	1	1	1	..	..	1	1	*	*	*	..	..	1
2255	.....do	1	1	*	..	1	1	1	1	1	*	1	*	*	*	*	*	1	1	*	1	1	1	..	*	*
2292	Second leverman	1	1	1	1	..	1	1	1	2	*	*	..	*	*	*	2	1	..	1	*	*	*	..	..	*
2368	.....do	*	*	*	*	..	*	*	*	..	1	1	..	1	1	1	1	1	..	1	1	1	1	..	..	*
2263	Pig machine helper	1	1	1	1	1	..	1	1	2	*	*	*	..	*	*	*	*	*	*	..	*	*	..	1	1
2035	.....do	*	*	*	*	*	*	..	*	..	*	*	*	*	..	1	1	1	1	1	1	..	1	2	..	*
2013	Ladle patcher foreman	*	*	*	*	*	..	*	*	..	1	1	1	..	1	1	1	1	1	1	..	1	1	..	..	*
2355	Ladle patcher laborer	*	*	*	..	*	*	*	*	..	1	1	1	1	1	1	1	1	..	1	1	1	2	*	..	*
2288	.....do	1	1	1	..	1	1	1	1	2	*	..	*	*	*	*	*	*	..	*	*	*	*	..	1	..
2361	.....do	1	1	1	1	..	1	1	1	2	*	*	..	*	*	*	*	*	..	*	*	*	*	..	1	1
2241	.....do	1	1	1	1	1	..	1	1	2	*	*	*	*	*	*	*	*	..	*	..	*	*	1	1	1
2304	.....do	*	..	*	*	*	*	*	*	..	1	1	1	1	1	..	1	1	1	1	1	1	1	..	*	*
2178	Pipe fitter	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1
2024	Pipe fitter helper	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1
2101	Millwright	1	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	*	*	*	*	*	*	..	1	1
2277	.....do	*	..	1	1	1	1	1	1	..	*	*	*	*	*	..	1	1	1	1	1	1	..	..	*	*
2075	Larry man	..	*	*	*	*	*	*	..	1	1	1	1	1	..	1	1	1	1	1	1	..	..	*	..	*
2079	.....do	*	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	*	*
2107	.....do	..	1	1	1	1	1	1	..	*	*	*	*	*	*	*	..	*	*	*	*	*	*	1	1	1
2214	.....do	1	..	1	1	1	1	1	1	..	*	*	*	*	*	*	*	..	*	*	*	*	*	..	1	1
2208	.....do	1	1	1	1	1	1	..	1	*	*	*	*	*	..	*	*	*	*	*	*	*	*	1	1	..
2332	.....do	1	1	..	1	1	1	1	1	*	..	*	*	*	..	*	*	..	*	*	*	*	*	1	1	1
2181	.....do	1	1	1	1	..	1	1	1	*	*	..	*	..	*	*	*	..	*	..	..	..	..	..	1	1
2136	.....do	*	*	*	..	*	..	*	*	1	1	..	1	1	1	1	1	1	..	1	1	1	1	*	*	..
2308	.....do	1	1	1	..	1	1	1	1	*	*	..	*	*	*	*	*	..	*	*	*	*	1	..	..	1
2215	Scrap man	1	1	1	1	1	..	1	*	*	*	*	*	..	*	*	*	*	..	*	*	*	1	..	..	1
2139	.....do	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2386	.....do	1	1	1	1	1	..	1	1	*	*	*	*	..	*	*	*	*	*	..	*	*	1	..	..	1
2313	.....do	*	*	*	..	*	*	*	*	1	1	..	1	1	1	1	1	1	..	1	1	1	1	..	..	1
2029	.....do	*	*	*	*	..	*	*	*	1	1	1	..	1	1	1	1	1	1	..	1	1	1	*	*	*
2076	Cagers	1	1	1	1	..	1	1	1	*	*	*	..	*	*	*	*	*	*	..	*	*	*	1	1	..
2036	.....do	1	1	..	1	1	1	1	1	..	..	*	*	*	*	*	*	..	*	*	*	*	*	1	1	1
2115	.....do	*	*	*	*	..	*	*	*	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	*	*
2352	.....do	*	*	..	*	*	*	*	*	1	..	1	1	1	1	1	1	..	1	1	1	1	1	*	..	*
2237		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2094	Skip hoist	..	1	1	1	1	1	..	..	*	*	*	*	*	*	..	*	*	*	*	*	..	1	1	1	
2097	.....do	1	..	1	1	1	1	1	..	*	*	*	*	*	*	..	*	*	*	*	*	..	1	1		
2096	.....do	*	..	*	*	*	*	*	..	1	1	1	1	1	1	..	1	1	1	1	1	..	*	*		
2129	.....do	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	1	1	1	1	1	..	*	*		
2242	Top man	*	*	*	*	*	*	..	*	1	1	1	1	1	1	..	1	1	1	1	1	1	1	*		
2334	.....do	1	1	1	1	..	1	1	1	*	*	*	..	*	*	*	*	*	*	..	*	*	*	1		
2057	.....do	*	*	*	*	*	*	..	*	*	1	1	1	..	1	1	1	1	1	1	..	1	1	*		
2173		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
2008	Ore bridge operator	*	1	..	1	1	1	1	1	*	*	*	*	..	*	*	1	..	1	1	1	1	1	*	*	*
2274	.....do	1	*	*	*	*	*	*	1	..	1	1	1	1	*	*	..	*	..	*	*	*	*	1	..	1
2336	Ore bridge oiler	1	*	*	*	*	*	*	1	..	..	1	1	1	1	*	*	*	..	..	..	..	1	1	1	1
2276	.....do	*	1	1	..	1	1	1	*	*	*	*	*	..	*	*	1	1	..	1	1	1	1	*	*	*
2223	Ore bridge laborer	1	*	*	*	*	*	*	..	1	1	1	..	1	1	1	*	*	*	*	..	*	*	1	1	1
2230	.....do	..	1	1	1	..	1	1	1	*	*	*	*	*	..	1	1	1	..	1	1	1	*	*	*	*

were on pay rolls greater part of the 2 months' period—Continued.

First month—Con.							Second month.																										
26	27	28	29	30	31	Total turns.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total turns.
..	1	1	1	*	..	26	*	*	..	*	*	*	1	1	1	..	1	1	1	*	*	*	..	*	*	*	1	1	1	..	1	1	1	..	..	*	..	24
1	..	1	1	*	..	26	*	*	*	..	*	*	1	1	1	1	..	1	1	*	*	*	*	..	*	*	1	1	1	1	..	1	1	*	*	*	..	27
..	*	*	*	1	..	25	1	1	..	1	1	1	*	*	*	..	*	*	1	1	1	1	..	1	1	1	*	*	*	..	*	*	1	1	1	..	26
*	..	*	*	*	..	25	1	1	1	..	1	1	*	*	*	*	..	*	*	1	1	1	1	1	..	1	1	*	*	*	..	*	*	1	1	..	1	26
1	1	1	1	..	..	25	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	..	1	1	1	27
1	1	1	..	..	..	25	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	..	1	1	1	27
*	*	*	*	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
1	1	1	1	..	..	24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
1	1	1	1	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
*	*	*	*	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
1	1	1	..	..	..	20½	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
*	*	*	..	..	..	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
..	1	1	1	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
..	*	*	*	..	..	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
1	..	1	1	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
*	*	*	..	..	..	25	..	..	..	..	..	..	..	..	1	1	1	1	1	..	..	..	..	1	1	1	2	..	*	*	*	*	*	..	*	*	24
*	*	*	*	*	..	24	..	*	*	*	*	*	..	..	1	1	1	1	1	..	..	..	..	1	1	1	2	..	*	*	*	*	*	..	*	*	24
*	*	*	*	..	..	26	*	*	..	*	*	*	..	1	1	..	1	1	1	1	1	1	..	1	1	1	2	*	*	..	*	*	*	*	*	..	26
1	1	1	1	1	..	26	1	..	1	1	1	1	2	*	*	..	*	*	*	*	*	*	..	*	*	*	..	1	..	1	1	1	1	1	1	..	26
..	1	1	1	1	..	26	1	1	..	1	1	1	2	*	*	..	*	*	*	*	*	*	..	1	1	*	..	1	1	..	1	1	1	1	1	1	..	26
..	..	1	..	..	..	24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
*	..	..	..	..	..	22	1	1	1	..	1	1	..	*	*	*	..	*	..	*	..	*	*	..	*	..	1	1	1	1	1	1	..	1	1	1	24
1	1	1	1	..	..	25	1	1	1	1	1	1	..	1	1	1	1	1	..	1	1	1	1	1	..	1	1	1	1	1	1	1	..	1	1	1	27
1	..	1	1	1	..	26	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	1	1	1	1	1	1	..	1	1	1	1	27
1	..	1	1	..	..	25	*	*	*	*	*	*	..	1	1	..	*	*	*	*	*	*	..	*	*	*	..	1	1	1	*	*	..	*	*	*	..	27
*	..	*	*	..	..	25	1	1	..	*	*	*	*	*	*	..	*	*	*	*	*	*	..	*	*	*	..	1	1	1	*	*	..	*	*	*	..	27
1	1	1	1	..	..	24	1	1	1	1	1	..	*	*	*	*	*	*	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	1	1	1	26
1	1	1	1	..	..	24	1	..	..	1	1	1	..	*	*	*	*	*	*	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	1	1	1	24
1	1	1	1	1	..	25	1	..	1	1	1	1	*	*	..	*	*	*	*	*	*	*	*	*	*	*	..	1	1	1	1	1	..	1	1	1	25
1	..	1	1	1	..	26	1	1	1	1	1	1	*	*	*	..	*	*	*	*	*	*	..	*	*	*	..	1	1	1	1	1	..	1	1	1	26
1	1	..	1	1	..	20	1	1	1	..	1	1	*	*	*	*	..	*	*	*	*	*	*	..	*	*	*	1	1	1	..	1	1	1	1	1	27
*	*	*	*	*	..	25	*	..	*	*	*	..	1	1	..	1	1	1	1	1	1	..	1	1	1	*	*	..	*	*	*	*	*	*	..	*	25
..	1	1	1	1	..	23	..	1	1	..	1	1	*	..	*	*	*	*	*	*	*	..	*	*	*	*	*	..	1	1	1	1	1	1	..	1	1	23
1	1	1	1	1	..	26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
..	..	..	..	..	..	.....	1	1	..	1	1	1	*	*	*	..	*	*	*	*	*	*	..	*	*	*	1	1	1	..	1	1	1	1	1	..	26
..	..	..	..	..	..	21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
1	1	1	2	..	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
*	..	*	*	*	..	26	*	*	*	..	*	*	1	1	1	..	1	1	1	1	1	..	1	*	*	*	*	..	*	*	*	*	*	*	*	..	27
1	1	1	1	1	..	26	1	..	1	1	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	1	..	1	1	1	1	1	1	..	26
1	1	..	1	1	..	27	1	1	1	..	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	1	1	1	1	1	1	1	1	..	27
..	*	*	*	*	..	26	*	*	..	*	*	*	1	1	1	..	1	1	1	1	1	1	..	1	1	1	*	*	*	..	*	*	*	*	*	*	..	26
*	*	..	*	*	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
..	..	..	..	..	..	.....	1	1	1	1	..	1	*	*	*	*	*	*	..	*	*	*	*	*	*	..	*	1	1	1	1	1	..	1	1	1	1	27
1	1	1	..	1	..	25	1	1	1	1	1	..	*	*	*	*	*	*	..	*	*	*	*	*	*	..	*	1	1	1	1	1	..	1	1	1	1	27
1	1	1	1	..	..	25	1	1	1	1	1	1	..	*	*	*	*	*	*	..	*	*	*	*	*	*	..	1	1	1	1	1	1	..	1	1	..	25
*	*	*	*	..	..	23	*	*	*	*	*	*	*	..	1	1	1	1	1	..	1	1	1	1	1	1	*	*	*	*	*	*	..	*	1	*	27⅞
*	*	*	..	..	..	25	*	*	*	*	*	*	..	1	1	1	1	1	..	1	1	1	1	1	1	..	*	*	*	*	*	*	..	..	..	..	22
*	*	..	*	*	..	26	*	*	*	*	..	*	1	1	1	1	1	..	1	1	1	1	1	1	..	1	*	*	*	*	*	*	*	*	*	*	27
..	1	1	1	1	..	26	1	1	..	1	1	*	*	*	*	..	*	*	*	*	*	*	..	*	*	*	1	1	1	1	1	1	1	1	1	..	26
..	..	..	..	..	..	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
..	..	..	..	..	..	.....	..	1	1	1	1	1	*	..	*	*	*	*	*	*	..	*	*	*	*	1	..	1	1	1	1	1	..	..	..	..	24
*	..	*	*	*	..	26	*	*	*	..	*	*	1	½	1	1	1	1	1	..	1	1	1	1	1	1	..	1	½	1	1	1	1	½	1	1	26½
1	1	1	1	1	..	26	..	1	1	1	1	1	*	..	1	1	1	1	1	..	1	1	1	1	1	1	..	1	½	1	1	1	1	½	1	1	25½
1	1	1	1	*	..	25	*	*	*	*	..	*	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	½	1	1	1	1	1	1	1	1	25½
*	*	..	1	*	1	26	1	..	1	1	1	1	*	½	1	1	1	1	1	..	1	1	1	1	1	1	..	1	½	1	1	1	1	½	1	1	26½
*	..	1	1	*	..	26	*	*	*	*	..	1	1	1	1	1	1	1	..	1	1	1	1	1	1	..	1	½	1	1	1	1	1	½	1	1	26½
*	*	*	*	*	..	25	1	1	..	1	1	1	*	..	1	1	1	1	1	1	1	1	1	1	1	1	..	1	½	1	1	1	1	½	1	1	26½

[Telegram.]

UNITED STATES STEEL CORPORATION,
Johnstown, February 7, 1912.

C. L. CLOSE:

No changes now, our letter October 23d. Five per cent total number of men working 12 hours.
3.49 P.

DANIEL COOLIDGE.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

DANIEL COOLIDGE,
President, Lorain Steel Co., Johnstown, Pa.

Are there any modifications or changes in statement your letter October 23, regarding 6-day week labor. Please give me percentage of total men employed working regularly 12 hours per day.

C. L. CLOSE.

THE LORAIN STEEL CO.,
Johnstown, Pa., October 23, 1911.

Mr. C. L. CLOSE,
United States Steel Corporation, New York, N. Y.

DEAR SIR: Answering your favor of the 19th instant, I desire to say that the few men which we had in our employ which were working over six days in a week were reduced to six days some eight months ago, and in view of the very small number of men which were so working it did not change any the description of our work.

Yours, truly,

DANIEL COOLIDGE, *President.*

THE LORAIN STEEL CO.,
Johnstown, Pa., September 13, 1911.

Mr. J. A. FARRELL,
President United States Steel Corporation, New York, N. Y.

DEAR SIR: Answering your favor of the 31st ultimo:

I am inclosing herewith statement of the average working conditions of to-day. Extraordinary conditions will alter this schedule in the case of individuals and occasionally in departments.

Generally speaking, overtime is eliminated and night turn taken off in the switch works, frog and crossing department, electric department, and pattern shop during the months of November, December, January, February, and March. The statement shows the working conditions from April 1 to November 1.

Trusting that this will meet your requirements, I remain,

Yours very truly,

DANIEL COOLIDGE, *President.*

The Lorain Steel Co.

[Sheet 2, Continuation of letter.]

	Day turn.				Night turn.				
	Regular hours per day on duty.	Hours per day actually working.	Regular hours per week on duty.	Average hours per week overtime.	Regular hours per night on duty.	Hours per night actually working.	Regular hours per week on duty.	Average hours per week overtime.	Total men.
Pattern shop	10	10	60	9	12½	12½	63¾	None.	75
Sw. Works & F. & X. department	10	10	60	7½	12½	12½	63¾	None.	705
Electric department	10	10	60	None.	12½	12½	63¾	None.	17
Mechanical department	10	10	60	5	12	12	60	5	50
Steam department	12	12	72	None.	12	12	72	None.	20
Steel foundry									400
Open-hearth furnaces—									
Melters and helpers (5)	12	6	72	None.	12	6	72	None.	.....
Stocker (3)	12	9	72	None.	12	6	72	None.	.....
Charger (2)	12	5	72	None.	12	5	72	None.	.....
Ladlemen and helpers (5)	12	10	72	None.	12	10	72	None.	.....
Crucible-furnace men (2)	12	6	72	None.	12	6	72	None.	.....
Cleaning room—									
Sand-blast men (20)	12	9	72	None.	12	9	72	None.	.....
Blacksmiths and helpers (6)	10	6	60	None.	.....	.....	.....	.....	.....
Chippers (30)	10	8	60	None.	.....	.....	.....	.....	.....
Laborers (138)	10	9	60	None.	12	10	72	None.	.....
Annealing furnaces (3)	10	5	60	5	.....	.....	.....	.....	.....
Molding floor—									
Molders (101)	10	7½	60	None.	.....	.....	.....	.....	.....
Molders' helpers (39)	10	8	60	None.	.....	.....	.....	.....	.....
Coremakers (26)	10	8½	60	None.	12	10	72	None.	.....
Cranemen (18)	10	9	60	None.	12	10	72	None.	.....
Iron foundry									80
Molders (33)	10	8½	60	None.	.....	.....	.....	.....	.....
Melting (3)	10	8	60	None.	.....	.....	.....	.....	.....
Cleaning (10)	10	9	60	None.	12	8	72	None.	.....
Coremakers (14)	10	8½	60	None.	.....	.....	.....	.....	.....
Laborers (20)	10	9½	60	None.	.....	.....	.....	.....	.....
J. & S. C. R. R.									17
Operating department	10	10	60	6	.....	.....	.....	.....	.....
Track department	10	10	60	None.	.....	.....	.....	.....	.....
Track-welding department	10	10	60	None.	12	12	72	None.	74
Ingleside Mine	9	9	48	None.	.....	.....	.....	.....	25
									1,463

[Telegram.]

UNITED STATES STEEL CORPORATION,
Pittsburgh, February 7, 1912.

C. L. CLOSE:

Statement accompanying my letter of Oct. 26th is correct, requiring no modification or change.

E. W. PARGNY.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

E. W. PARGNY,
President American Sheet & Tin Plate Co.,
Frick Building, Pittsburgh, Pa.

Are there any modifications or changes to make in statement letter October 26, regarding 6-day week?

C. L. CLOSE.

AMERICAN SHEET & TIN PLATE CO.,
Pittsburgh, October 26, 1911.

Mr. C. L. CLOSE,
Committee of Safety,
United States Steel Corporation,
71 Broadway, New York, N. Y.

DEAR SIR: Referring to your letter of October 29, I am inclosing herewith a statement which shows the number and percentage of employees working in and around our various plants 8, 9, 10, 11, and 12 hours per day.

With respect to the elimination of the 7-day week, we have had but little to do in that direction, as the only men generally employed in our works during seven days are watchmen, water tenders, etc.; and these throughout our company would not aggregate more than 2 per cent of the total.

I feel certain that the inclosed statement giving data relative to number and percentage of men working 8, 9, 10, 11, and 12 hours per day will prove very interesting to you.

Yours, very truly,

E. W. PARGNY, *President.*

American Sheet & Tin Plate Co., accounting department.

[Subject: Number and percentage of employees working 8, 9, 10, 11, and 12 hours per day during last half of September, 1911.]

Mill letter.	Mill No.	Name and location.	Number of mills.	8 hours.		9 hours.		10 hours.		11 hours.		12 hours.		Total.	
				Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
B	1	American, Elwood, Ind.	28	303	49.4	4	0.6	250	40.8	4	0.6	52	8.5	613	99.9
T	2	Anderson, Anderson, Ind.	7												
S	3	Cambridge, Cambridge, Ohio	7	204	52.0			159	40.6			29	7.4	392	100.0
H	4	Chester, Chester, W. Va.	7	291	56.4			166	32.2	18	3.5	41	7.9	516	100.0
G	5	Crescent, Cleveland, Ohio.	6	176	48.7			141	39.1	6	1.6	38	10.5	361	100.0
J	6	Falson, Niles, Ohio.													
L	7	Humbert, Connellsville, Pa.	6									3	100.0	3	100.0
N	8	LaBelle, Wheeling, W. Va.	10									3	100.0	3	100.0
O	9	Laughlin, Martins Ferry, Ohio.	23	571	8.9			278	28.7			120	12.4	969	100.0
Q	10	Monongahela, Pittsburgh, Pa.	8	270	52.7			175	34.2			67	13.1	512	100.0
R	11	Morewood, Gas City, Ind.	8					1	33.3			2	66.7	3	100.0
U	12	National, Monessen, Pa.	25	727	56.4			435	33.7	32	2.5	95	7.4	1,289	100.0
W	13	New Castle, New Castle, Pa.	20	593	57.5			317	30.7	8	0.8	114	11.0	1,032	100.0
X	14	Pennsylvania, New Ken, Pa.	8	258	54.2			143	30.0	10	2.1	65	13.7	476	100.0
Y	15	Pittsburgh, New Ken, Pa.	8	269	55.7			135	27.9	12	2.5	67	13.9	483	100.0
D	16	Sabraton, Morgantown, W. Va.	10	242	54.6	1	0.2	166	37.5	2	0.5	32	7.2	443	100.0
F	17	Shenango, New Castle, Pa.	30	717	53.0			491	36.3	4	0.3	140	10.4	1,352	100.0
C	18	United States, Demmler, Pa.	11	241	50.1			144	29.9	28	5.8	68	4.1	481	99.9
A	21	Sharon, South Sharon, Pa.	20	540	53.8			308	30.7	5	0.5	151	1.5	1,004	100.0
		Total, tin mills.	242	5,402	54.4	5	0.0	3,309	33.3	129	1.3	1,087	10.9	9,932	99.9
E	60	Roll and Machine, Canton, Ohio.						135	75.0	2	1.1	43	23.9	180	100.0
AA	30	Aetna Standard, Bridgeport, Ohio.	23	434	46.4			285	30.5	55	5.9	161	17.2	935	100.0
GG	31	Canal Dover, Canal Dover, Ohio.	11	409	57.6			196	27.6	51	7.2	54	7.6	710	100.0
MM	32	Canton, Canton, Ohio.	5												
OO	33	Dresden, Dresden, Ohio.	4									2	100.0	2	100.0
CC	34	Guernsey, Cambridge, Ohio.	11	342	48.0	2	0.2	196	27.5	117	16.4	56	7.9	713	100.0
HH	35	Hyde Park, Hyde Park, Pa.	6	164	68.3			57	23.7			19	7.9	240	99.9
LL	36	Leechburg, Leechburg, Pa.	11	365	64.5			153	27.0	9	1.6	39	6.9	566	100.0
P	37	Midland, Muncie, Ind.	7					2	50.0			2	50.0	4	100.0
FF	38	New Philadelphia, New Philadelphia, Ohio.	12	387	58.3			205	30.9	29	4.4	43	6.5	664	100.1
DD	39	Old Meadow, Scottdale, Pa.	8	277	67.9			87	21.3	20	4.9	24	5.9	408	100.0
JJ	40	Piqua, Piqua, Ohio.	4									1	100.0	1	100.0
BB	41	Saltsburg, Saltsburg, Pa.	4									2	100.0	2	100.0
I	42	Scottdale, Scottdale, Pa.	9	314	43.9			254	35.5	71	9.9	77	10.8	716	100.1
KK	43	Struthers, Struthers, Ohio.	6									2	100.0	2	100.0

American Sheet & Tin Plate Co., accounting department—Continued.

Mill letter.	Mill No.	Name and location.	Number of mills.	8 hours.		9 hours.		10 hours.		11 hours.		12 hours.		Total.	
				Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
V	44	Vandergrift, Vandergrift, Pa.	37	1,200	41.4	.....	.....	400	13.8	600	20.7	700	24.1	2,900	100.0
H	45	Wellsville, Wellsville, Ohio	10	286	41.8	.....	.....	249	36.3	34	5.0	116	16.9	685	100.0
Z	46	Wood, McKeesport, Pa.	13	165	26.2	.....	.....	330	52.5	35	5.6	99	15.7	629	100.0
K	47	Gary, No. 1, Gary, Ind.	.....	240	25.8	166	17.8	439	47.2	.....	.....	85	9.1	930	99.9
PP	49	Mercer, South Sharon, Pa.	5	.....	.....	.....	.....	.....	.....	.....	.....	2	100.0	2	100.0
WW	65	Waverly Warehouses, Newark, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		Total, sheet mills	186	4,583	45.3	168	1.7	2,853	28.2	1,021	10.1	1,484	14.7	10,109	100.0
		Grand total	428	9,985	49.4	173	.9	6,297	31.1	1,152	5.7	2,614	12.9	20,221	100.0

[Telegram.]

UNITED STATES STEEL CORPORATION,
Chicago, February 9, 1912.

C. L. CLOSE:

The average for 1911 of 12 hours, so-called turn men, was 30 per cent of total number of employees. This includes construction men. Of men employed in operating, 35 per cent work regularly 12 hours.

E. M. HAGER.

UNIVERSAL PORTLAND CEMENT CO.,
Chicago, November 7, 1911.

Mr. C. L. CLOSE,
Committee of Safety, United States Steel Corporation,
71 Broadway, New York City.

DEAR SIR: In reply to your letter of the 20th, I am pleased to say that we have put in operation the six-day week completely, with the single exception of the operation of all our kilns on Sundays. This has been accomplished by the expenditure of large sums of money at each of our plants—Nos. 2, 3, 4, and 5—for additions and alterations, as well as the greater investment in our new plant No. 6, which is just coming into operation. It was necessary to increase the equipment in our raw-material mills and the capacity of our finishing mills so as to prepare the amount of raw material and to grind the clinker in six days that was formerly done in seven. In other words, an addition of one-sixth more work each week day.

It was necessary to provide storage facilities at each plant to store raw material to run the kilns 24 hours, aggregating over 10,000 tons.

This plan is working very satisfactorily, with the result that no men work on Sundays except those necessary for the operation of the kilns, which must be operated without interruption.

Our best practice shows that 75 or 80 per cent of our force are off on Sundays, and it is compulsory for the majority that work on Sunday to take a day off during the week.

We have been working this out gradually and find that it works very well.

In regard to hours of labor, I hand you herewith copy of statement recently furnished Mr. Farrell on this subject.

I trust this gives you the information you desire. If not, I will be pleased to have you advise me.

Yours, very truly, EDWARD M. HAGER, *President.*

Universal Portland Cement Co.

Men on 12-hour turns.	Number of hours active.	Remarks.
Tube mill operators	8	Helping foremen 2 hours.
Ball mill	9	
Scale operators	8	
Hopper men	10	
Ball and tube mill helpers	11	
Slag and stone drier feeders	11	
Slag-drier firemen	7	Hard work.
Stone-drier firemen	7	Do.
Slag-drier men	10	
Stone-drier men	10	
Burner men	10	
Burner barmen	9	Do.
Fuller mill operators	8	
Firemen in coal house	9	
Kent mill operators	9	
Kent mill helpers	10	
Stock-house man	6	Rest of time watching.
General labor	10	
Mill handy men, R. M. & F. M	8	
Mill handy men, B. B	7	
Mill machinists	9	
Oilers	8	
Clinker crane operators	9	
2 electricians	9	
Men on 10 hour turns; cement packers	8	

UNIVERSAL PORTLAND CEMENT CO,
Chicago, October 30, 1911.

Mr. J. A. FARRELL,
President, United States Steel Corporation,
71 Broadway, New York City.

DEAR SIR: I regret the delay in replying to your letter regarding the number of hours of active labor of the employees of this company.

We have made a number of observations in trying to determine as accurately as possible the time that the men are actively occupied in the various positions.

The operating men in the plant are theoretically always on duty, but as most of the appliances are practically automatic, there are few positions requiring hard physical exertion. The work consists mostly of adjusting feeds of and lubricating the machines and cleaning up around same, in the performance of which they are active the number of hours shown on that attached statement, the rest of the time they are watching the machinery.

The cement packing comprises the hardest physical labor of any occupation around the cement plant, and the packers are allowed, as a rule, during the hot weather season an extra man in a gang of six, and the natural delays due to moving cars and setting empties at the packing rooms, and other incidental delays, give them all occasionally a few minutes rest.

We have not included the machinists working in the shop, as they never have hard physical labor; the only mechanics who have to work hard are repair men out in the mill in cases of breakdown, which of course, are not of frequent occurrence.

Our plants are now so arranged that 75 or 80 per cent of our force is off on Sundays, and it is compulsory for the majority who work on Sunday to take a day off during the week. We are planning this out gradually and find that it works out very well.

I will be pleased to furnish any further information on this matter if you so desire.

Yours very truly,

EDWARD M. HAGER, *President.*

[Telegram.]

UNITED STATES STEEL CORPORATION,
Duluth, Minn., February 7, 1912.

C. L. CLOSE:

Only men working 7 days a week and 12-hour shifts are pump men and firemen; percentage to total labor employed 8½ per cent. Others 91½ per cent.

W. J. OLCOTT.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

W. J. OLCOTT.
President Oliver Iron Mining Co., Wolvin Building, Duluth, Minn.:

Will you please advise to what extent 6-day labor has been put into effect in your company? Would like percentage of total men employed working regularly 7 days per week. Also percentage of total men employed working regularly 12 hours per day.

OLIVER IRON MINING CO.,
GENERAL OFFICES, WOLVIN BUILDING,
Duluth, Minn., September 14, 1911.

Mr. JAMES A. FARRELL,
President United States Steel Corporation,
Empire Building, 71 Broadway, New York, N. Y.

MY DEAR SIR: I acknowledge herewith receipt of your favor of the 6th instant, asking for statement showing the average hours of rest and active labor of the different classes of employees of this company.

It is my understanding from your letter that you desire to ascertain the actual hours of continuous labor that our various employees work while on duty as compared with the time of rest while he is on such duty.

Owing to the nature of our mining operations, it is very difficult to secure such information. I inclose, however, a classification of our labor, divided into surface and

underground, and showing the hours of labor for which the various classifications are paid each day, and the number of hours of rest that they have outside of the day's labor. The working day consists of 10 hours, with the exception of firemen and pump men, who of necessity relieve in place, and eight-hour shift for miners and others sinking shafts in wet places where we use an eight-hour shift, the men relieving in place.

In our underground work none of our men actually work over eight hours, for the reason that, after blasting, the men are not able to go back into their drifts and stopes until the smoke has disappeared, and during such times they of course rest.

We have no strenuous occupations where men work under oppressed or disagreeable conditions. Our mines are all well ventilated and we do not have the gases that are encountered in coal-mining operations.

In our steam-shovel operations, while the work is active during the actual loading of trains, there is always an intermittent period of a few minutes while the loaded trains are going out and empties are being put in.

I do not know of any of our employees who are overworked or who do not have ample rest during the 24 hours of the day.

If the above does not give you the information in exactly the form that you desire it, I will be glad to endeavor to furnish such additional data as you may indicate.

Very truly, yours,

W. J. OLCOTT, *President*.

Classification of labor.

Class of labor.	Hours of—		Remarks.
	Labor.	Rest.	
Underground.			
Mining captains	10	14	
Shift bosses	10	14	
Miners	10	14	
Timbermen	10	14	
Trammers	10	14	
Pumpmen	12	12	Relieve in place.
Skip tenders	10	14	
General underground laborers	10	14	
Surface.			
Locomotive engineers	10	14	
Locomotive firemen	12	12	Do.
Locomotive brakemen	10	14	
Steam-shovel engineers	10	14	
Steam shovel cranemen	10	14	
Steam-shovel firemen	12	12	Do.
Stationary engineers	10	14	
Stationary firemen	12	12	Do.
Switchmen	10	14	
Machinists	10	14	
Carpenters	10	14	
Blacksmiths	10	14	
Masons	10	14	
Teamsters	10	14	
Common laborers	10	14	
Office men	9 to 10	14 to 15	

OLIVER IRON MINING CO.,
GENERAL OFFICES, WOLVIN BUILDING,
Duluth, Minn., August 9, 1911.

MY DEAR SIR: Replying to your favor of the 5th instant, asking for certain information regarding the nationality of our employees, their living conditions, improvements made to better their condition, policy of housing, etc., I beg to inclose herewith statement compiled as of February 1, 1911, covering nationalities at all of our mines on the various ranges, from which you will see that the great majority of our employees are of foreign birth. I also send you detailed statement as of April 3, 1911, showing the number of dwellings, boarding houses, and camps at each of our mines on all of the ranges, together with the number of men housed and percentage of employees housed.

I am satisfied that the living conditions at all of our mines are such as to bear investigation and will compare very favorably with those furnished by other companies in the various districts in which we are operating. These conditions have been very

much improved since the organization of the steel company, in that we have erected hundreds of houses for our men which are designed to meet the varying conditions and sizes of families. These houses are well constructed, warm, and kept in first-class condition. We have made special efforts to see that the houses and surroundings are kept in a clean and sanitary condition. The rents charged for these houses are very reasonable as compared with the prices paid for similar houses owned by other people. Our rule is to charge $1 per month for each $100 invested in the house; this does not include the value of the lot. We keep the house in repair. The policy of furnishing good houses at a reasonable rental enables us to keep a better class of men than we would otherwise obtain. Furthermore, where our operations are located at some distance from towns and villages, it is absolutely necessary for us to own these houses.

I might say that the houses that we have erected are of a much higher grade and more artistic than those that were used in previous years. Furthermore, wherever electricity is available these houses have been wired and are lighted by that means. At many points we have planted trees and shrubbery, graded streets, and endeavored to a reasonable extent to beautify the surroundings. Wherever possible, we have furnished our mine locations and houses with city water, and a large number of our houses are provided with bath and toilet rooms. During the past few years we have also erected greatly improved change houses where the men can leave their clothes and wash. These buildings are put up as nearly fireproof as possible, lighted by electricity, have concrete floors and sanitary conditions for washing, and are also provided with shower baths and steel lockers in which the men can keep their clothes under lock and key. We have found that the men have taken very kindly to the use of shower baths, and it has proved a great success.

At several of our more important points where we have large shops, as at Virginia and Hibbing, we have put up separate buildings where machinists' helpers and other employees can have steel lockers and a suitable place in which to wash and bathe. This policy has proved very satisfactory and will undoubtedly be further extended. At some of our larger engine houses we have put in toilet rooms and washing facilities.

As to what the foreigners have done to better their own condition, would state that on the older ranges they have to a large extent built and improved their homes and surroundings. But this is not true on the Kissabe Range, where so much of our labor is what we call common labor employed around the open pits. In this locality the efforts that have been made to improve their condition have principally been started by ourselves. We have been quite successful in our efforts at times when labor was very plentiful, but when we are operating to full capacity and men are scarce they prefer to live in poorer houses, with a number of men crowded into one house, and under conditions such as we do not approve of.

I am positive that the living conditions prevailing at all of our mining districts are far better than those that prevail in other mining districts of the United States and that more has been done to furnish employees with comfortable, sanitary, and attractive homes than in any mining community with which I am familiar.

In regard to educational facilities, there is no place where they have better buildings or equipment or teachers than on the iron ranges. The school population at all of these mining towns increases very rapidly, and it has required large expenditures for the erection of buildings to furnish adequate school facilities. In the majority of these schools we have not only the graded courses and high-school courses, but also domestic science and manual training. Books and other material are furnished free. It has been the policy of our company to approve of and encourage the upbuilding of the school systems at all mining points.

At two points, viz, Hibbing and Virginia, we have erected clubhouses and furnished the same for employees. These were started several years ago and have proven very satisfactory as furnishing desirable quarters in which the men may spend their spare time in the way of amusement, social intercourse, reading, etc. Some place of this kind is absolutely necessary, otherwise the men will go to saloons and other places. The results secured at these two points are so satisfactory that we shall, when business conditions improve, advocate and recommend the erection of similar buildings at other important mining districts.

It has been our policy to render substantial assistance to Y. M. C. A. and to all churches, regardless of denomination.

We have this day sent Mr. Close a long telegram covering certain expenditures that have been made for improving the condition of our employees and which I understand was for your information.

Trusting this will give you the desired information, I am,

Very truly, yours,

W. J. OLCOTT, *President.*

Mr. J. A. FARRELL,
President, Empire Building, 71 Broadway, New York City.

Oliver Iron Mining Co., nationality statement.

[Compiled as of Feb. 1, 1911.]

	American.	Austrian.	Belgian.	Bohemian.	Bulgarian.	Canadian.	Danish.	English.	Finnish.	French.	German.	Greek.	Hebrew.	Hollander.	Hungarian.	Italian.	Irish.	Montenegrin.	Norwegian.	Polish.	Roumanian.	Russian.	Scotch.	Swedish.	Swiss.	Total.
MESABI RANGE.																										
Hibbing district:																										
Mississippi	4	68	....	....	....	....	....	3	48	2	1	2	....	....	....	30	3	18	6	1	....	1	....	4	....	191
Mace	....	46	....	....	....	....	....	3	32	....	....	....	....	....	....	9	2	11	....	....	....	....	3	5	....	111
Harold	8	76	....	....	....	....	....	4	58	....	4	....	....	....	....	9	2	4	4	....	....	....	2	5	....	176
Hull-Rust	132	181	10	....	30	....	....	13	5	8	5	4	....	....	....	16	8	....	11	3	....	1	2	16	....	445
Burt-Sellers	81	250	....	....	....	1	....	3	15	9	4	....	1	....	....	97	10	....	....	2	1	....	....	20	....	494
Morris	14	....	....	....	....	2	....	....	5	1	....	....	....	....	....	19	....	....	2	....	1	....	....	2	....	46
Winifred	....	....	....	....	....	....	....	1	2	....	....	....	....	....	1	44	....	....	1	....	....	....	....	1	....	50
District	58	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	6	....	66
Shops	77	10	....	....	....	12	....	3	19	1	6	....	....	....	1	3	1	....	....	11	....	....	1	7	1	153
Total	374	631	10	....	30	15	....	31	184	21	20	6	1	....	2	227	26	33	24	18	2	2	8	66	1	1,732
Chisholm district:																										
Glen	4	168	....	....	....	....	....	....	7	2	1	....	....	....	....	7	....	3	....	....	1	20	....	1	....	214
Clark	17	222	....	....	....	....	....	....	15	2	....	....	....	....	....	16	....	....	....	....	....	21	....	10	....	303
Leonard	40	144	....	....	....	....	....	1	8	....	1	....	....	....	....	21	....	....	....	9	....	3	....	17	....	244
Monroe	68	97	....	1	....	....	....	9	30	2	....	....	....	....	....	101	....	....	2	13	....	5	....	4	....	332
Chisholm	22	246	....	....	....	....	....	3	43	1	....	....	....	....	....	18	....	....	6	20	....	5	....	11	....	375
Hartley	75	20	....	1	....	....	....	1	33	....	1	....	2	2	....	44	3	28	1	19	11	....	1	14	....	256
Myers	8	20	....	2	....	....	....	2	31	....	1	....	1	....	....	2	1	12	....	8	....	....	....	1	....	89
St. Clair	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Total	234	917	....	4	....	....	....	17	167	7	4	....	3	2	....	209	4	43	9	69	12	54	1	58	....	1,814
Virginia district:																										
Sauntry-Alpena	50	134	....	....	....	....	....	....	109	8	12	....	....	....	....	66	....	....	....	15	....	....	....	29	....	423
Virginia	52	96	....	....	....	....	....	....	90	2	....	....	....	....	....	8	....	....	....	25	....	....	....	56	....	329
Headquarters	77	15	....	....	....	....	....	....	11	5	....	....	....	....	....	7	....	....	....	3	....	....	....	33	....	151
Higgins No. 2	16	77	....	....	....	....	....	....	22	2	....	....	....	....	....	33	....	....	....	5	....	....	....	2	....	157
Stephens	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Mountain Iron	....	2	....	....	....	....	....	....	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	6

Oliver Iron Mining Co., nationality statement—Continued.

	American.	Austrian.	Belgian.	Bohemian.	Bulgarian.	Canadian.	Danish.	English.	Finnish.	French.	German.	Greek.	Hebrew.	Hollander.	Hungarian.	Italian.	Irish.	Montenegrin.	Norwegian.	Polish.	Roumanian.	Russian.	Scotch.	Swedish.	Swiss.	Total.
MESABI RANGE—continued.																										
Adams district:																										
Adams	7	160	.....	.....	3	.....	.....	13	59	1	4	.....	.....	.....	10	43	6	.....	1	.....	13	2	.....	31	.....	353
Spruce	8	288	.....	.....	.....	.....	.....	16	81	11	.....	.....	.....	.....	32	91	2	6	2	.....	.....	.....	2	8	.....	547
Stripping	82	87	.....	.....	1	.....	.....	6	30	10	1	.....	2	.....	.....	50	3	.....	3	.....	.....	.....	.....	15	.....	290
Leonidas	17	11	.....	.....	.....	.....	2	2	16	.....	.....	.....	.....	.....	.....	22	.....	.....	.....	.....	.....	.....	.....	7	.....	77
Clerks, etc	56	.....	.....	.....	2	.....	1	5	1	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	7	.....	75
Total	170	546	.....	.....	6	.....	3	42	187	22	5	.....	2	.....	42	206	14	6	6	.....	13	2	2	68	.....	1,342
Fayal district:																										
Fayal	64	175	.....	1	.....	7	1	28	89	.....	2	.....	1	.....	.....	164	1	.....	6	.....	.....	4	1	16	.....	560
Genoa	30	79	.....	.....	.....	11	.....	5	32	.....	.....	.....	.....	.....	.....	3	.....	22	3	4	.....	.....	.....	4	.....	193
Gilbert	17	22	.....	.....	.....	5	.....	8	8	.....	1	.....	.....	.....	.....	1	5	.....	2	2	.....	.....	.....	2	.....	73
Total	111	276	.....	1	.....	23	..1	41	129	.....	3	.....	1	.....	.....	168	6	22	11	6	.....	4	1	22	.....	826
Biwabik district:																										
Duluth	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	3
McKinley	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Total	2	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	4
Canisteo district:																										
Canisteo	213	236	.....	.....	89	.....	.....	7	31	18	3	.....	.....	.....	.....	13	5	.....	.....	.....	.....	.....	.....	73	.....	688
Holman	48	24	.....	.....	.....	.....	.....	3	39	4	.....	.....	.....	.....	.....	32	6	.....	.....	.....	.....	.....	2	20	.....	178
Hill	130	161	.....	1	76	.....	.....	13	61	16	5	.....	.....	.....	.....	18	18	.....	.....	2	.....	.....	.....	70	.....	571
Total	391	421	.....	1	165	.....	.....	23	131	38	8	.....	.....	.....	.....	63	29	.....	.....	2	.....	.....	2	163	.....	1,437
VERMILION RANGE.																										
Pioneer	22	283	.....	.....	.....	.....	.....	23	124	5	1	.....	.....	.....	.....	16	4	.....	.....	4	.....	5	2	26	.....	514
Zenith	3	222	.....	.....	.....	.....	.....	14	81	1	.....	.....	.....	.....	.....	12	.....	4	.....	.....	.....	.....	.....	3	.....	340
Sibley	5	119	.....	.....	.....	.....	.....	6	35	2	.....	.....	.....	.....	.....	17	.....	.....	.....	.....	.....	.....	.....	8	.....	192
Savoy	.....	30	.....	.....	.....	.....	.....	2	12	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	49
Soudan	6	29	.....	.....	.....	.....	.....	5	21	2	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	30	.....	94
Total	36	683	.....	.....	.....	.....	.....	49	273	10	1	.....	.....	.....	.....	51	4	4	.....	4	.....	5	2	67	.....	1,189

GOGEBIC RANGE.																								
Norris	17	21	15	10	....	....	....	51	94	....	....	....	....	....	20	6	11	....	....	50	....	....	....	48	....	343
East Norris	36	20	1	....	....	....	1	42	143	8	4	....	....	....	29	10	10	....	5	62	....	....	....	96	....	407
Pabst	19	153	42	....	....	....	1	23	52	1	2	....	....	....	....	63	1	....	....	23	....	....	....	11	....	391
Aurora	41	36	1	6	....	....	....	47	81	7	....	....	....	....	20	16	5	....	....	40	....	....	....	36	....	336
Puritan	13	....	....	....	....	....	....	6	21	5	1	....	....	....	....	26	1	....	....	13	....	....	1	19	....	106
Chicago	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Tilden	43	40	1	5	....	....	....	13	41	....	5	....	....	....	10	84	....	....	....	41	....	....	4	10	1	298
Atlantic	17	10	16	....	....	....	....	7	43	....	1	....	....	....	....	59	2	....	....	25	....	....	1	13	....	194
Geneva	9	....	....	....	....	....	....	3	29	1	3	....	....	....	....	7	2	....	....	....	....	....	....	....	....	54
Davis	9	....	....	....	....	....	....	1	24	....	....	....	....	....	....	13	2	....	....	1	....	....	....	7	....	57
Plumer	2	3	....	....	....	....	....	5	34	....	....	....	....	....	....	14	....	....	....	7	....	....	....	1	....	66
Ironwood district	44	2	....	....	....	....	....	7	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	6	....	60
Total	250	285	76	21	....	....	2	205	562	22	16	....	....	....	79	298	35	....	5	262	....	....	6	248	1	2,373
MARQUETTE RANGE.																										
Lake Superior	8	....	....	....	....	57	1	91	78	....	11	....	....	1	....	8	73	....	27	....	....	....	3	56	....	414
Queen	....	9	....	....	....	24	6	123	123	1	5	....	....	....	....	71	9	....	3	....	....	....	....	41	....	415
Champion	2	1	....	....	....	12	....	10	11	....	....	....	....	....	....	....	2	....	1	....	....	....	1	8	....	48
Stegmiller	....	....	....	....	....	3	....	9	18	....	....	....	....	....	....	34	2	....	4	....	....	....	....	6	....	76
Total	10	10	....	....	....	96	7	233	230	1	16	....	....	1	....	113	86	....	35	....	....	....	4	111	....	953
BARABOO DISTRICT.																										
Iroquois	14	1	....	....	....	....	....	7	1	1	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	39
MENOMINEE RANGE.																										
Chapin	5	129	1	....	....	....	....	128	13	19	13	....	....	....	....	288	6	....	12	....	....	....	1	180	....	790
Aragon	....	5	69	....	....	....	1	33	20	23	2	....	....	9	....	15	7	....	13	41	....	....	2	164	....	404
Riverton	....	70	....	....	....	....	....	9	20	2	4	....	....	....	....	6	7	....	2	36	....	....	4	16	....	176
Mansfield	....	5	....	....	....	....	....	14	40	....	1	....	....	2	....	27	6	....	....	12	....	....	1	6	....	114
Michigan	....	3	....	....	....	....	....	5	55	2	1	....	....	....	....	17	....	....	1	8	....	....	1	7	....	95
Cundy	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	2
Iron Ridge	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Explorations	1	1	....	....	....	....	....	11	2	5	....	....	....	....	....	....	1	....	....	1	....	....	1	5	....	28
Total	6	213	70	....	....	....	1	197	150	51	21	....	....	11	....	353	27	....	29	93	....	....	10	378	....	1,610

Oliver Iron Mining Co., nationality statement—Continued.

	American.	Austrian.	Belgian.	Bohemian.	Bulgarian.	Canadian.	Danish.	English.	Finnish.	French.	German.	Greek.	Hebrew.	Hollander.	Hungarian.	Italian.	Irish.	Montenegrin.	Norwegian.	Polish.	Roumanian.	Russian.	Scotch.	Swedish.	Swiss.	Total.
MESABI RANGE—continued.																										
Adams district:																										
Adams	7	160			3			13	59	1	4				10	43	6		1		13	2		31		353
Spruce	8	288						16	81	11					32	91	2	6	2				2	8		547
Stripping	82	87			1			6	30	10	1		2			50	3		3					15		290
Leonidas	17	11					2	2	16							22								7		77
Clerks, etc	56				2		1	5	1								3							7		75
Total	170	546			6		3	42	187	22	5		2		42	206	14	6	6		13	2	2	68		1,342
Fayal district:																										
Fayal	64	175		1		7	1	28	89		2		1			164	1		6			4	1	16		560
Genoa	30	79				11		5	82							3		22	3	4				4		193
Gilbert	17	22				5		8	8		1					1	5		2	2				2		73
Total	111	276		1		23	1	41	129		3		1			168	6	22	11	6		4	1	22		826
Biwabik district:																										
Duluth	1						1																1			3
McKinley	1																									1
Total	2						1																1			4
Canisteo district:																										
Canisteo	213	236			89			7	31	18	3					13	5							73		688
Holman	48	24						3	39	4						32	6						2	20		178
Hill	130	161		1	76			13	61	16	5					18	18			2				70		571
Total	391	421		1	165			23	131	38	8					63	29			2			2	163		1,437
VERMILION RANGE.																										
Pioneer	22	283						23	124	5	1					16	4			4		5	2	28		514
Zenith	3	222						14	81	1						12		4						3		340
Sibley	5	119						6	35	2						17								8		192
Savoy		30						2	12							5										49
Soudan	6	29						5	21	2						1								30		94
Total	36	683						49	273	10	1					51	4	4		4		5	2	67		1,189

GOGEBIC RANGE.																								
Norris	17	21	15	10				51	94					20	6	11			50				48		343
East Norris	36	20	1				1	42	143	8	4			29	10	10		5	62				96		467
Pabst	19	153	42				1	23	52	1	2				63	1			23				11		391
Aurora	41	36	1	6				47	81	7				20	16	5			40				36		336
Puritan	13							6	21	5	1				26	1			13			1	19		106
Chicago																							1		1
Tilden	43	40	1	5				13	41		5			10	84				41			4	10	1	298
Atlantic	17	10	16					7	43		1				59	2			25			1	13		194
Geneva	9							3	29	1	3				7	2									54
Davis	9							1	24						13	2			1				7		57
Plumer	2	3						5	34						14				7				1		66
Ironwood district	44	2						7								1							6		60
Total	250	285	76	21			2	205	562	22	16			79	298	35		5	262			6	248	1	2,373
MARQUETTE RANGE.																								
Lake Superior	8					57	1	91	78		11			1	8	73		27				3	56		414
Queen		9				24	6	123	123	1	5				71	9		3					41		415
Champion	2	1				12		10	11							2		1				1	8		48
Stegmiller						3		9	18						34	2		4					6		76
Total	10	10				96	7	233	230	1	16			1	113	86		35				4	111		953
BARABOO DISTRICT.																								
Iroquois	14	1						7	1	1	15														39
MENOMINEE RANGE.																								
Chapin	5	129	1					123	13	19	13				286	6		12				1	180		790
Aragon		5	69				1	33	20	23	2			9	15	7		13	41			2	164		404
Riverton		70						9	20	2	4				6	7		2	36			4	16		176
Mansfield		5						14	40		1			2	27	6			12			1	6		114
Michigan		3						5	55	2	1				17			1	3			1	7		95
Cundy								1										1							2
Iron Ridge								1																	1
Explorations	1	1						11	2	5						1			1			1	5		28
Total	6	213	70				1	197	150	51	21			11	353	27		29	93			10	378		1,610

Oliver Iron Mining Co., nationality statement—Continued.

RECAPITULATION.

	American.	Austrian.	Belgian.	Bohemian.	Bulgarian.	Canadian.	Danish.	English.	Finnish.	French.	German.	Greek.	Hebrew.	Hollander.	Hungarian.	Italian.	Irish.	Montenegrin.	Norwegian.	Polish.	Roumanian.	Russian.	Scotch.	Swedish.	Swiss.	Total.
Mesabi Range:																										
Hibbing district	374	631	10	....	30	15	.....	31	184	21	20	6	1	....	2	227	26	33	24	18	2	2	8	66	1	1,732
Chisholm district	234	917	.....	4	.....	.....	.....	17	167	7	4	.....	3	2	.....	209	4	43	9	69	12	54	1	58	....	1,814
Virginia district	195	324	.....	.....	.....	.....	.....	.....	233	20	12	.....	.....	.....	.....	114	.....	.....	.....	48	.....	.....	.....	121	....	1,067
Adams district	170	546	.....	.....	6	.....	3	42	187	22	5	....	2	....	42	206	14	6	6	.....	13	2	2	68	....	1,342
Fayal district	111	276	.....	1	.....	23	1	41	129	.....	3	....	1	.....	.....	168	6	22	11	6	....	4	1	22	....	826
Biwabik district	2	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	....	4
Canisteo district	391	421	.....	1	165	.....	.....	23	131	38	8	.....	.....	.....	.....	63	29	.....	.....	2	.....	.....	2	163	....	1,437
Mesabi Range	1,477	3,115	10	6	201	38	5	154	1,031	108	52	6	7	2	44	987	79	104	50	143	27	62	15	498	1	8,222
Vermilion Range	36	683	.....	.....	.....	.....	.....	49	273	10	1	.....	.....	.....	.....	51	4	4	.....	.....	4	5	2	67	....	1,189
Gogebic Range	250	285	76	21	.....	.....	2	205	562	22	16	.....	.....	.....	79	298	35	.....	5	262	.....	.....	6	248	1	2,373
Marquette Range	10	10	.....	.....	.....	96	7	233	230	1	16	.....	.....	1	.....	113	86	.....	35	.....	.....	.....	4	111	....	953
Baraboo Range	14	1	.....	.....	.....	.....	.....	7	1	1	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	39
Menominee Range	6	213	70	.....	.....	.....	1	197	150	51	21	.....	.....	11	.....	353	27	.....	29	93	.....	.....	10	378	....	1,610
Grand total	1,793	4,307	156	27	201	134	15	845	2,247	193	121	6	7	14	123	1,802	231	108	119	498	31	67	37	1,302	2	14,386

Dwelling and boarding houses, Oliver Iron Mining Co.

Mine.	Dwellings.	Boarding houses.	Camps.	Number of men—		Per cent housed.
				Housed.	Employed.	
Menominee:						
Chapin	146			161	790	20.4
Aragon	13			12	404	3.0
Riverton	32	1		82	176	46.6
Mansfield	27	1		48	114	42.1
Michigan	5	1		12	95	12.6
Iron Ridge [1]	8			1	1	100.0
Cundy [1]	23			1	2	50.0
Forest [2]	3	1				
Cuff	8					
Total Menominee range	260	4		317	1,582	20.0
Marquette Range:						
Lake Superior	186			203	407	49.0
Winthrop [3]	26			26		
Queen [4]	2			2	389	
Race Course [4]	21					
Mitchell [4]	1			26		7.2
Macomber [4]	1					
Platt [1]	1			1		
Moore [5]	1	1		1	1	100.0
Stegmiller	3	1		13	75	17.3
Champion	100	2		20	43	46.6
Total Marquette Range	342	4		292	975	30.0
Gogebic Range:						
Norris-Aurora	103	1		172	1,675	10.9
Tilden	5			8	298	2.7
Atlantic	12			11	196	5.6
Chicago	1			1	1	100.0
Geneva	12	1		43	54	79.6
Puritan	35	1		85	106	80.2
Davis	21			39	63	61.9
Plumer	2	1		6	80	7.5
Total Gogebic Range	191	4		365	2,373	15.4
Vermilion Range:						
Pioneer	28			54	480	11.2
Zenith	4			17	312	5.4
Sibley	4			9	195	4.6
Savoy	1			1	40	2.5
Soudan	62	8		20	203	9.8
Total Vermilion Range	99	8		101	1,230	8.2
Chisholm district:						
Monroe	48	1	1	112	318	35.0
Chisholm	3			25	379	6.6
Clark	15			3	299	1.0
Glen	41			80	223	36.0
Leonard	24	3	3	60	336	18.0
Myers	16			30	75	40.0
Hartley	46	2	5	171	337	51.0
St. Clair	6		1	13	1	
Pillsbury	5			9	1	
Total Chisholm district	204	6	10	503	1,969	25.5
Virginia district:						
Mountain Iron		1			6	
Virginia	21	1	3	55	400	13.8
Higgins	24	1	2	42	160	26.3
Alpena			3	25	459	5.4
Stephens	26		4	1	1	100.0
Headquarters	42	2		29	140	20.7
Total Virginia district	113	5	12	152	1,166	13.0

[1] Mine idle.
[2] Mine idle; no employees.
[3] Mine idle, but houses used by employees section 21 mine.
[4] Dwellings at Race Course, Mitchell and Macomber properties (23 in all), are for use of employees at Queen mine, and percentage is figured on basis of 389 men to 28 men housed.
[5] Mine idle; but 1 man employed as caretaker.

Dwelling and boarding houses, Oliver Iron Mining Co.—Continued.

Mine.	Dwelling.	Boarding houses.	Camps.	Number of men— Housed.	Number of men— Employed.	Per cent housed.
Biwabik district:						
Duluth [1]						
McKinley [1]	15	2	3			
Canton [1]	1					
Total Biwabik district	16	2	3			
Fayal district:						
Fayal	95	1	2	178	574	31.0
Geneva	44			53	132	40.0
Gilbert	44	3		52	76	68.0
Total Fayal district	183	4	2	283	782	36.2
Adams district:						
Adams	52		2	117	727	14.7
Spruce	16			34	569	6.0
Auburn	1	1		2	2	100.0
Leonidas	15			21	78	27.0
Total Adams district	84	1	2	174	1,376	12.6
Canisteo district:						
Canisteo	107	4	17	378	663	57.0
Holman	72	2	9	96	171	56.0
Hill	56	2	15	297	561	53.0
Concentrator	11	2	[2] 2	33	57	58.0
Total Canisteo district	246	10	43	804	1,452	55.0
Hibbing district:						
Mississippi	10	2		75	235	31.9
Mace	1	1		24	103	23.3
Harold	11	1	1	37	277	13.4
Hull-Rust & Penobscot	91	6	7	304	796	38.2
Burt Sellers & Townsite	62	1	6	209	518	40.4
Morris-Winnifred	22	2	3	34	102	33.3
Miscellaneous					163	
Total Hibbing district	197	13	17	683	2,194	31.1

RECAPITULATION.

Missabe Range	1,043	41	89	2,599	8,939	29.0
Menominee Range	260	4		317	1,582	20.0
Marquette Range	342	4		292	975	30.0
Gogebic Range	191	4		365	2,378	15.4
Vermilion Range	99	8		101	1,230	8.2
Grand total	1,935	61	89	3,674	15,099	24.3

[1] Mine idle.

[2] Being erected.

[Telegram.]

UNITED STATES STEEL CORPORATION,
Pittsburgh, February 10, 1912.

C. L. CLOSE:

Have not heard from all plants, but basing on returns from two-thirds of the plants, I am sure that not over 5 per cent of men work 12 hours, these usually on night turn, and work only five nights per week. No work Saturday night or Sunday night.

F. B. THOMPSON.

AMERICAN BRIDGE CO., FRICK BUILDING,
Pittsburgh, Pa., February 8. 1912.

Mr. C. L. CLOSE,
United States Steel Corporation, New York City.

DEAR SIR: Your telegram received. I know of no modifications or changes to make in the statement I made to Mr. Farrell in reference to six-day week labor.

As far as the percentage of men employed by this company regularly for 12 hours per day is concerned, I have asked our auditor, Mr. Thompson, to make up a statement and send it to you. If there is any further information on this matter that you want, please take up with Mr. Thompson, as I expect to be away for three or four weeks.

Yours, very truly,

AUG. ZIESING, *President.*

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

AUGUST ZIESING,
President, American Bridge Co., Frick Building, Pittsburgh, Pa.:

Are there any modifications or changes to make in your statement, letter to Mr. Farrell dated November 13, regarding six-day week labor? Would like to have percentage of total men employed working regularly 12 hours per day.

C. L. CLOSE.

AMERICAN BRIDGE CO.,
Chicago, Ill., October 24, 1911.

Mr. C. L. CLOSE,
Committee of Safety, United States Steel Corporation,
71 Broadway, New York City.

DEAR SIR: Your letter of October 20 was received.

We are now getting up a report which was asked for by President Farrell, which will show how many of our men work more than six days a week, also what hours per day they are employed.

I think that, speaking in a general way, we have succeeded pretty fairly in introducing the six-day week, and in very few cases do we work men more than 12 hours in any one day. A very large majority of men work only 10 hours.

As soon as the above-mentioned report has been completed, I will send you a copy.

Very truly, yours,

AUG. ZIEZING, *President.*

AMERICAN BRIDGE CO.,
Chicago, Ill., November 13, 1911.

Mr. J. A. FARRELL,
President, United States Steel Corporation,
71 Broadway, New York City, N. Y.

DEAR SIR: Some time ago you asked for some information about the hours worked per day and the number of days worked per week by the employees of the American Bridge Co.

At our bridge plants our men are worked 54 hours per week; that is, 10 hours for each of 5 days and 4 hours on Saturday. Some plants change this to 9 hours each day for 6 days in the week during the winter months. None of these men work more than 10 hours per day except occasionally when we are hard pushed for deliveries when we may work a few hours overtime on certain machines in order to catch up with our work.

This, however, does not include watchmen. Our watchmen are on duty 12 hours each day, and in many cases work seven days in the week except when they ask for a day off which is always granted them on request.

For the Pencoyd mill I have had a statement made up showing the nominal and actual hours that men are on duty, also showing the time that they are at work while on duty. The figures given in this report may vary some from time to time, particularly the actual time working and the time resting, but in a general way they show a fair average for our Pencoyd mill.

The men at our Pencoyd mill are worked only six days per week excepting the watchmen, who are worked the same number of days per week as the watchmen at our bridge plants.

Yours, truly,

AUG. ZIESING, *President.*

Average actual working and resting time for various positions, Penecyd plant, American Bridge Co.

Occupation.	Turn.	Hours on duty.		Time actually working.	Time resting.
		Nominal.	Actual.		
Open-hearth department:			H. m.	H. m.	H. m.
Melter	Night	12	13 56	9 44	4 12
Do	Day	12	10 04	8 59	1 05
Assistant melter	Night	12	13 50	7 19	6 31
Do	Day	12	10 05	7 35	2 29
First helper	Night	12	14 00	6 35	7 25
Do	Day	12	10 60	4 57	5 03
Second helper	Night	12	14 00	12 17	1 43
Do	Day	12	10 00	8 03	1 57
Charging machine operator	Night	12	14 00	6 59	7 01
Do	Day	12	9 57	4 35	5 22
Floor crane operator	Night	12	14 00	7 16	6 44
Do	Day	12	10 00	7 39	2 21
Engineer, stock	Night	12	13 45	10 39	3 06
Do	Day	12	10 30	7 24	3 06
Brakemen, stock	Night	12	13 52	10 20	3 32
Do	Day	12	10 12	6 38	3 34
Puncher	Night	12	13 59	7 29	6 30
Do	Day	12	10 00	6 12	3 48
Boss stocker	Night	12	14 00	11 44	2 16
Do	Day	12	10 00	8 14	1 46
Stockers	Night	12	14 00	12 02	58
Do	Day	12	10 00	9 02	58
Stock distributer	Night	12	14 07	12 50	1 17
Do	Day	12	10 00	7 43	2 17
Pit foreman	Night	12	13 30	10 07	3 23
Do	Day	12	10 15	8 37	1 38
Pitman	Night	12	14 00	8 50	5 10
Do	Day	12	10 00	6 13	3 47
Ladle man	Night	12	13 56	10 30	3 26
Do	Day	12	9 57	8 16	1 41
Pit Craneman	Night	12	14 00	6 32	7 28
Do	Day	12	10 00	6 13	3 47
Engineer, N. G. ingot	Night	12	14 00	9 01	4 59
Do	Day	12	10 00	6 59	3 01
Brakemen, N. G. ingot	Night	12	14 00	8 24	5 36
Do	Day	12	10 00	5 29	4 31
Ingot weigher	Night	12	14 00	7 54	6 06
Do	Day	12	10 00	5 11	4 49
Stopper maker	Do	10	10 00	9 14	46
Blooming mill:					
Heater	Do	12	10 30	7 33	2 57
Do	Night	12	13 06	8 37	4 29
Helper	Day	12	10 30	7 10	3 20
Do	Night	12	12 47	6 22	6 25
Furnace crane operator	Day	12	10 30	7 49	2 41
Do	Night	12	12 47	8 57	3 50
Engineer	Day	12	10 30	8 58	1 32
Do	Night	12	12 55	10 27	2 28
Assistant engineer	Day	12	10 17	8 22	1 55
Do	Night	12	13 25	11 27	1 58
Oiler	Day	12	10 30	8 27	2 03
Do	Night	12	13 39	9 16	4 15
Wrenchman	Day	12	10 30	6 46	3 44
Do	Night	12	13 30	9 27	4 03
Manipulator	Day	12	10 32	6 53	3 39
Do	Night	12	13 28	8 33	4 55
Screwman	Day	12	10 30	6 53	3 37
Do	Night	12	13 30	8 35	4 55
Roller tableman	Day	12	10 30	5 43	4 47
Do	Night	12	13 30	7 42	5 48
Hotbed man	Day	12	10 30	6 49	3 41
Do	Night	12	13 30	8 18	5 12
Shear table operator	Day	12	10 30	7 12	3 18
Do	Night	12	13 30	8 39	4 51
Shearsman	Day	12	10 30	6 28	4 02
Do	Night	12	13 30	7 40	5 50
Assistant Shearsman	Day	12	10 30	6 28	4 02
Do	Night	12	13 30	7 40	5 50
Shear crane operator	Day	12	10 45	6 20	4 25
Do	Night	12	13 30	7 17	6 23
Weigher	Day	12	10 37	6 37	4 00
Do	Night	12	13 30	7 43	5 47

Average actual working and resting time for various positions, Pencoyd plant, American Bridge Co.—Continued.

Occupation.	Turn.	Hours on duty.		Time actually working.	Time resting.
		Nominal.	Actual.		
			H. m.	H. m.	H. m.
22-28-inch finishing mill:					
Roller	Day	12	11 30	10 27	1 03
Do	Night	12	12 33	8 34	3 59
Engineer 23-inch mill	Day	12	10 08	7 54	2 14
Do	Night	12	13 59	12 31	1 28
Engineer 28-inch mill	Day	12	10 10	7 28	2 42
Do	Night	12	13 53	10 20	3 33
Assistant engineer 23-inch mill	Day	12	10 21	7 53	2 28
Do	Night	12	13 26	11 52	1 34
Assistant engineer 28-inch mill	Day	12	10 05	7 04	3 01
Do	Night	12	13 57	8 34	5 23
Screwman	Day	12	11 22	9 36	1 46
Do	Night	12	12 45	10 20	2 25
Manipulator	Day	12	11 22	9 34	1 48
Do	Night	12	12 45	10 20	2 25
Craneman, hotbed	Day	12	11 0	8 06	2 54
Do	Night	12	13 0	5 57	7 03
Saw operator	Day	12	10 51	8 06	2 45
Do	Night	12	12 52	9 47	3 05
Guideman	Day	12	11 18	10 07	1 11
Do	Night	12	12 43	11 49	54
Tablemen	Day	12	11 16	9 49	1 27
Do	Night	12	12 59	10 59	2 00
Buggy operator	Day	12	11 15	10 22	53
Do	Night	12	12 51	9 51	3 00
Recorder	Day	12	10 40	8 24	2 16
Do	Night	12	13 14	10 15	2 59
Assistant recorder	Day	12	11 01	8 46	2 15
Do	Night	12	12 57	9 33	3 24
Straightener	Day	12	10 52	9 21	1 31
Do	Night	12	13 11	11 26	1 45
Heater	Day	12	11 24	10 12	1 12
Do	Night	12	12 30	10 33	1 57
Heater helper	Day	12	10 57	6 46	4 11
Do	Night	12	12 34	5 46	6 48
Door boy	Day	12	10 30	9 39	51
Do	Night	12	13 31	10 15	3 16
20-inch finishing mill:					
Roller	Day	12	12. 0	10 40	1 20
Do	Night	12	12 0	10 20	1 40
Guide	Day	12	12 0	10 40	1 20
Do	Night	12	12 0	10 50	1 10
Tablemen	Day	12	10 30	9 10	1 20
Do	Night	12	13 30	11 50	1 40
First assistant recorder	Day	12	10 30	9 10	1 20
Do	Night	12	13 30	11 50	1 40
Second assistant recorders	Day	12	10 30	9 10	1 20
Do	Night	12	13 30	11 50	1 40
Heater	Day	12	12 0	9 20	2 40
Do	Night	12	12 0	8 50	3 10
H. B. controller operator	Day	12	10 30	8 10	2 20
Do	Night	12	13 30	10 20	3 10
Heater helper	Day	12	10 30	7 50	2 40
Do	Night	12	13 30	10 00	3 30
Engineer	Day	12	10 30	8 50	1 40
Do	Night	12	13 30	11 09	2 30
Furnace cont. operator	Day	12	10 30	8 00	2 30
Do	Night	12	13 30	10 20	3 10
Charger	Day	12	10 30	7 50	2 40
Do	Night	12	13 30	10 20	3 10
Saw boy	Day	12	10 30	7 50	2 40
Do	Night	12	13 30	10 20	3 10
Recorder	Day	12	10 30	8 00	2 30
Do	Night	12	13 30	10 20	3 10
12-inch finishing mill:					
Rollers	Day	12	12 0	10 30	1 30
Do	Night	12	13 0	9 45	3 15
Roller helper	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Roughers	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Spell rougher	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Catcher	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 10	4 20

Average actual working and resting time for various positions, Pencoyd plant, American Bridge Co.—Continued.

Occupation.	Turn.	Hours on duty.		Time actually working.	Time resting.
		Nominal.	Actual.		
			H. m.	H. m.	H. m.
12-inch finishing mill—Continued.					
Hook-up	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Hook-in	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Spell catcher and hook-up	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Spell roller helper and hook-in	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Finish hook-up	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Straightener	Day	12	12 0	8 30	3 30
Do	Night	12	12 0	8 15	3 45
Spell straightener	Day	12	12 0	8 30	3 30
Do	Night	12	12 0	8 15	3 45
Heater	Day	12	12 0	10 00	2 00
Do	Night	12	12 0	9 12	2 48
Heater helpers, first	Day	12	10 30	8 30	2 00
Do	Night	12	13 30	10 05	3 25
Heater helpers, second	Day	12	10 30	8 30	2 00
Do	Night	12	13 30	10 05	3 25
Charger	Day	12	10 30	8 25	2 05
Do	Night	12	13 30	9 55	3 35
Telegraph man	Day	12	10 30	8 30	2 00
Do	Night	12	13 30	10 05	3 25
Recorder	Day	12	10 30	7 30	3 00
Do	Night	12	13 30	10 00	3 30
Hotbed men	Day	12	12 0	8 30	3 30
Do	Night	12	12 0	8 15	3 45
Engineer	Day	12	10 30	7 36	2 54
Do	Night	12	13 30	10 10	3 20
Finish hook-in	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
Ex-spell hook	Day	12	10 30	7 15	3 15
Do	Night	12	13 30	9 20	4 10
O. H. Department and 36-inch mill gas makers:					
Foreman gas maker	Day	12	10 07	7 51	2 16
Do	Night	12	13 52	10 49	3 03
Gasmen	Day	12	10 05	8 39	1 26
Do	Night	12	13 51	9 43	4 08
28-inch mill gas makers:					
Foreman	Day	12	10 20	6 40	3 40
Do	Night	12	13 40	8 20	5 20
Gasmen	Day	12	10 10	5 20	4 50
Do	Night	12	13 50	9 40	4 10
12-inch mill gas makers:					
Gasmen	Day	12	10 15	6 05	4 10
Do	Night	12	13 45	9 10	4 35

AMERICAN BRIDGE CO.,
Chicago, Ill., September 25, 1911.

MY DEAR MR. FARRELL: Again referring to your letter of the 31st, in which you ask for complete information on the subject of hours of work per day and days of work per week of our employees at our plants and mills, I wish to say it is taking us longer to gather together this information than I have anticipated, as we have not up to the present time kept a tabulated record covering these points on which you wish information. I hope, however, in the very near future to be able to make you a complete report.

In the meantime I wish to say that I feel very sure that at all of our plants and mills we have been for some time enforcing the order of giving every man one day rest out of seven, and I do not believe that we have worked any man more than twelve consecutive hours per day for a year or more.

Very truly, yours, AUG. ZIESING, *President.*

Mr. J. A. FARRELL,
President United States Steel Corporation, 71 Broadway, New York City.

[Telegram.]

UNITED STATES STEEL CORPORATION,
Birmingham, Ala., February 7, 1912.

C. L. CLOSE:

Of the total number employed at Ybena, including mines, furnaces, steel works, etc., about *pirne ofyfs per cent* worked regularly on *pizcb* hour turns during the period covered by last data secured. Conditions now are practically same as then.

GEO. G. CRAWFORD.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

GEO. C. CRAWFORD,
President Tennessee Coal, Iron & Railroad Co.,
Brown-Marx Building, Birmingham, Ala.

Will you please give me percentage of total employees in your company working regularly twelve hours per day?

C. L. CLOSE.

TENNESSEE COAL, IRON & RAILROAD CO.,
Birmingham, Ala., September 25, 1911.

DEAR SIR: I regret to say that a rapid expansion in our blast-furnace department "played hob" with our six-day-week schedule. We had it started early this summer, and then had to blow in furnaces rapidly to respond to a sudden demand. Now we have all the furnaces in that we will probably blow in for some time, and we expect to go after the six-day week vigorously, and expect to have a different report the next time you call for some data.

Yours, very truly, GEO. G. CRAWFORD, *President.*

Mr. R. C. BOLLING,
(Care of United States Steel Corporation),
71 Broadway, New York, N. Y.

TENNESSEE COAL, IRON & RAILROAD CO.,
Birmingham, Ala., January 24, 1912.

DEAR SIR: Referring further to your letter of December 20, I inclose herewith accurate statistics showing just what has been accomplished in regard to the six-day week.

Yours, truly,

GEO. G. CRAWFORD, *President.*

Mr. C. L. CLOSE,
(Care of United States Steel Corporation),
71 Broadway, New York, N. Y.

TENNESSEE COAL, IRON & RAILROAD CO.,
Birmingham, Ala., January 9, 1912.

DEAR SIR: Referring to your letter of the 20th ultimo, in regard to six-day-week labor and reduction in the number of hours employees work, I wish to advise that we are preparing a full report on this matter and same will be forwarded within the next day or two.

In order to give you an idea, however, as to the progress we have made in this direction, I attach herewith a statement showing the percentage of employees working over six days per week in our blast-furnace department at Bessemer, Alice, and Ensley, from which you will notice that we have entirely eliminated seven-day week at Bessemer and Alice and have made considerable progress at Enslev.

Yours, truly,

GEO. G. CRAWFORD, *President.*

Mr. C. L. CLOSE,
(Care of United States Steel Corporation),
71 Broadway, New York City.

Percentage of employees working over six days per week.

["A" represents percentage based on number of men enrolled. "B" represents percentage based on number of men employed (average).]

Week ending—	Bessemer.		Alice.		Ensley.		Week ending—	Bessemer.		Alice.		Ensley.	
	A	B	A	B	A	B		A	B	A	B	A	B
Oct. 1, 1911	61	50	51	76	55	61	Nov. 19, 1911	1	2	7	9	12	15
Oct. 8, 1911	37	50	61	70	43	53	Nov. 26, 1911	.....	.....	6	8	17	21
Oct. 15, 1911	26	38	45	61	41	50	Dec. 3, 1911	.....	.....	2	3	24	28
Oct. 23, 1911	26	40	43	56	61	69	Dec. 10, 1911	.....	.....	5	6	18	23
Oct. 29, 1911	24	35	47	71	49	56	Dec. 17, 1911	.....	.....	1	1	17	21
Nov. 5, 1911	14	20	27	33	20	25	Dec. 24, 1911	.....	.....	.....	.....	16	20
Nov. 12, 1911	6	9	5	6	18	24	Dec. 31, 1911	.....	.....	.....	.....	17	22

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911.

BLAST FURNACE DEPARTMENT.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
General.						
Superintendent	1	10	10	0	0	Supervisions
Assistant superintendent	1	12	12	0	0	Do.
Night superintendent	1	12	12	0	0	Do.
Superintendent's clerk	1	12	10	2	0	Intermittent light work.
Accounts department clerk	1	11	9	2	0	Do.
Furnace practice	1	12	9	3	0	Do.
Coke inspector	1	11	9	2	0	Supervision.
Iron-yard foreman	1	12	12	0	0	Do.
Hot-metal weighman	2	12	7	5	0	Interval between furnace casts.
Sample man	2	12	10	2	0	Do.
Mail carrier	1	12	9	3	0	Intermittent, light work.
Engine-revolution checker	2	12	9	3	0	Do.
Painter and window cleaner	1	10	9	1	0	Interruptions due to chg. work.
Total	16	150	127	23	0	
Furnace operations.						
Foreman stock dumpers	1	12	11	1	0	Supervision.
Brown ore crane operator	1	12	10	2	0	Intervals in stock supply.
Wrenchers	4	12	10	2	0	Intervals due to shifting cars.
Knockout men	8	12	10	2	0	Do.
Stock-house foreman	2	12	12	0	0	Supervision.
Scale-car operators	10	12	10	2	0	Variation demand fces.
Scale-car operators, helpers	10	12	10	2	0	Do.
Skip-hoist men	10	12	10	2	0	Do.
Scrap handlers	30	11	10	1	0	Do.
Track and pit men	7	12	10	2	0	Operating interruptions.
Stock-house labor	3	11	9	2	0	Do.
Braize-machine operator	2	12	10	2	0	Intermittent operation.
Braize-machine operator, helper	1	12	.....	.....	.....	Do.
Inspector force tops	2	12	7	5	0	Supervision.
Stove-elevator operator	2	12	8	4	0	Intermittent, light work.
Scrap-hoist operator	1	12	10	2	0	Operating interruptions.
Total	94	190	147	31	0	
Casting.						
Boss foundryman	2	12	12	0	0	Supervision.
Blower, forces 2 and 3	2	12	12	0	0	Do.
Blower, force 1	2	12	12	0	0	Do.
Blower, forces 5 and 6	2	12	12	0	0	Do.
Stove tenders	10	12	7	5	0	Interval between chgs. and casts.
Keepers	10	12	8	4	0	Do.
First helpers	10	12	8	4	0	Do.
Second helpers	10	12	8	4	0	Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BLAST FURNACE DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
Casting—Continued.						
Third helpers	4	12				Position abolished.
Cinder snappers	10	12	9	3	0	Interval between chgs. and casts.
Ladle dispatcher	2	12	10	2	0	Intermittent light work.
General labor foreman	1	12	12	0	0	Supervision.
Assistant labor foreman	1	12	12	0	0	Do.
Night labor foreman	1	12	12	0	0	Do.
Laborers	45	10	9	1	0	Operating interruptions.
Open sand molder	1	10	9	1	0	Do.
Assistant sand molder	1	10	9	1	0	Do.
Molders' helpers	2	10	9	1	0	Do.
Stove tender helpers	1	12	7	5	0	Interval between chgs. and casts.
Total	117	220	177	31	0	
Ladle house and pig machine.						
Foreman ladle house and pig machine.	2	12	12	0	0	Supervision.
Ladlemen	1	12	10	2	0	Shop interruptions.
Ladle liners	2	12	10	2	0	Do.
Ladle liners' helpers	4	12	10	2	0	Do.
Crush and grind pan man	4	12	10	2	0	Do.
Laborers	1	12	10	2	0	Do.
Cranemen	1	12	8	4	0	Variable demand for crane.
Cast machine, first helper	4	12	10	2	0	Irregular supply iron.
Cast machine, second helper	12	12	10	2	0	Do.
Iron ladle oilers	2	12	10	2	0	Intermittent light work.
Total	33	120	100	20	0	
Cinder bank.						
Cinder ladle foreman	2	12	12	0	0	Supervision.
Cinder dump foreman	2	12	11	1	0	Do.
Cinder dumpers	2	12	8	4	0	Interval between cinder runs.
Hot pot gear cleaner and oiler	2	12	8	4	0	Do.
Hot pot pipe fitter	2	12				Position abolished.
Total	10	60	39	9	0	
GENERAL BOILER DEPARTMENT.						
General foreman (day)	1	12	12	0	0	Supervision.
General foreman (night)	1	12	12	0	0	Do.
Total	2	24	24	0	0	
No. 1 steam plant.						
Water tender	4	12	12	0	0	Supervision.
Head fireman	2	12	10	2	0	Variable demand steam.
Firemen	8	12	10	2	0	Do.
Coal and ash rollers	4	10	9	1	0	Do.
Boiler reamer	2	10	9	1	0	Irregular boiler washing.
Boiler reamer helper and washers.	6	10	9	1	0	Do.
Boiler-flue blowers	3	10	9	1	0	Intermittent light work.
Boiler blow off men	2	10				Position abolished.
Coal and ash hoist operator	1	12	9	3	0	Intermittent light work.
Coal and ash helper	1	12	9	3	0	Do.
Flue dust roller	2	12	9	3	0	Do.
Heater and pump men	2	12	10	2	0	Do.
Total	37	134	105	19	0	

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BLAST FURNACE DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
No. 2 steam plant.						
Water tender	4	12	12	0	0	Supervision.
Firemen	4	12	8	4	0	Variable demand steam.
Boiler reamer	1	10	9	1	0	Irregular boiler washing.
Boiler helpers and washers	2	10	9	1	0	Do.
Coal and ash roller	1	10	9	1	0	Intermittent light work.
Water heater and pump men	2	12	10	2	0	Do.
Flue blower	2	10	8	2	0	Do.
Total	16	76	65	11	0	
Water-purifying plant.						
Filter men	2	12	10	2	0	Intermittent occupations.
Filter men helpers	2	12	10	2	0	Do.
Total	4	24	20	4	0	
No. 1 engine room.						
First engineer	4	12	12	0	0	Intermittent light work.
Second engineer	4	12	12	0	0	Do.
Condenser engineer	2	12	12	0	0	Do.
Condenser engineer helper	2	12	12	0	0	Do.
Engine oiler	8	12	8	4	0	Do.
Engine wiper	3	12	8	4	0	Do.
Oil filter men	2	10	8	2	0	Do.
Floor sweeper	1	10	9	1	0	Do.
Total	26	92	81	11	0	
No. 2 engine room.						
First engineers	2	12	12	0	0	Intermittent light work.
Second engineers	2	12	12	0	0	Do.
Condenser engineers	2	12	12	0	0	Do.
Dynamo and air pump men	2	12	12	0	0	Do.
Engine oilers	4	12	8	4	0	Do.
Engine wipers	2	12	8	4	0	Do.
Floor sweeper	1	10	9	1	0	Do.
Total	15	82	73	9	0	
Furnace pump house.						
No. 6 furnace pump men	2	12	12	0	0	Intermittent light work.
Cooling station pumps.						
Pump men	2	12	.....	.....	.....	Position abolished.
Mechanical department, general.						
Power master mechanic	1	12	12	0	0	Supervision.
Assistant master mechanic	1	12	12	0	0	Do.
Furnace master mechanic	1	12	12	0	0	Do.
Night master mechanic	1	12	12	0	0	Do.
Master mechanic clerk	1	10	9	1	0	Intermittent light work.
Material chaser and checker	1	10	.....	.....	.....	Position abolished.
First class repair men	2	10	9	1	0	Delays incident to mechanical work.
Do	1	10	9	1	0	Do.
Second class repair man	1	10	9	1	0	Do.
Third class repair men	2	10	9	1	0	Do.
Fourth class repair man	1	10	9	1	0	Do.
Repair men helpers	6	10	9	1	0	Do.
Millwright foreman	1	12	12	0	0	Do.
Assistant millwright foreman	1	12	11	1	0	Do.
Night millwright foreman	1	12	11	1	0	Do.
Millwrights	3	12	10	2	0	Do.
Millwrights' helpers	10	12	10	2	0	Do.
Pipe-fitter foreman	1	10	8	2	0	Do.
Pipe fitters	3	10	9	1	0	Do.
Pipe fitters' helpers	5	10	9	1	0	Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BLAST FURNACE DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
***Mechanical department, general*—Continued.**						
Hoist-engine oiler	2	12	9	3	0	Delays incident to mechanical work.
Furnace-top oiler	2	12	9	3	0	Do.
Cast-house trolley boy	2	12	7	5	0	Do.
Stove cleaners	4	10	9	1	0	Intermittent occupation.
Steam-gauge repair man	1	10	9	1	0	Delay incident to mechanical work.
Total	55	274	234	30	0	
Pump repairs.						
Second class repair men	1	10	9	1	0	Delays incident to mechanical work.
Fourth class repair men	1	10	9	1	0	Do.
Total	2	20	18	2	0	
Cinder pot repairs.						
Second class repairmen	1	10	8	2	0	Intermittent occupation.
Cinder pot helpers	3	10	8	2	0	Do.
Total	4	20	16	4	0	
Blowing engine repairs.						
No. 1 and 2 engine rooms:						
Second class repair men	1	12	10	2	0	Delays incident to mechanical work.
Repair men helpers	2	12	10	2	0	Do.
Fourth class repair men	1	12	10	2	0	Do.
Pipe fitter	1	10	9	1	0	Intermittent occupation.
Pipe fitter helper	1	10	9	1	0	Do.
Craneman	1	12	.....	.....	.....	Position abolished.
Total	1	68	48	8	0	
No. 1 engine room:						
First class repair men	3	10	9	1	0	Delays incident to mechanical work.
Second class repair men	2	10	9	1	0	Do.
Repair men helpers	5	10	9	1	0	Do.
Fourth class repair men	1	10	9	1	0	Do.
Craneman	1	10	8	2	0	Intermittent work.
Total	12	50	44	6	0	
No. 2 engine room:						
First class repair men	1	10	9	1	0	Delays incident to mechanical work.
Repair men helpers	2	10	9	1	0	Do.
Second class repair men	1	10	9	1	0	Do.
Craneman	1	10	9	1	0	Intermittent work.
Total	5	40	36	4	0	
Casting machine repairs.						
First class repair man	1	10	9	1	0	Intermittent work.
Fourth class repair man	1	10	9	1	0	Do.
Total	2	20	18	2	0	
Furnace pipe fitters.						
Pipe fitters' helpers	2	12	8	4	0	Intermittent occupation.
Do	3	12	8	4	0	Do.
Total	5	24	16	8	0	

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 25, 1911—Continued.

BLAST FURNACE DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
Furnace pipe fitters—Contd.						
Electricians:						
Motor inspector	2	12	8	4	0	Intermittent occupation.
Motor tender	2	12	8	4	0	Do.
Total	4	24	16	8	0	
Blacksmith shop:						
Blacksmith	1	10	9	1	0	Delays incident to machine work.
Do	1	10	9	1	0	Do.
Do	1	10	9	1	0	Do.
Blacksmith helpers	4	10	9	1	0	Do.
Hammer boy	1	10	6	4	0	Do.
Total	8	50	42	8	0	

OPEN-HEARTH DEPARTMENT.

General, plants 1 and 2.						
Superintendent	1	10	10	0	0	Supervision.
Delay clerk and acting night superintendent.	1	12	12	0	0	Do.
Assistant superintendent	1	10	10	0	0	Do.
Product clerk	1	10	8	2	0	Intermittent light work.
Clerk	1	10	8	2	0	Do.
Delay clerks	1	12	10	2	0	Do.
Sweeper superintendent's office.	1	12	10	2	0	Do.
Mold record man	1	10				Position abolished.
Ingot tracer	2	12	10	2	0	Intermittent light work.
Ingot weighman	2	12	10	2	0	Do.
Cold ingot chaser	2	12	10	2	0	Do.
Total	14	122	98	14	0	
Gas producers, No. 2 plant.						
Foremen	2	12	12	0	0	Supervision.
Assistant foreman and stopper puller.	2	12	10	2	0	Intermittent light work.
Gas makers	16	12	10	2	0	Do.
Foreman fire cleaners	2	12	10	2	0	Intermittent heavy work.
Fire cleaners	6	12	10	2	0	Do.
Coal and ash hoist men	2	12	10	2	0	Intermittent light work.
Coal handlers	1	12	10	2	0	Do.
Coal larry men	2	12	10	2	0	
Total	33	96	82	14	0	
Gas producers, No. 1 plant.						
Foremen	2	12	12	0	0	Supervision.
Gas makers	8	12	10	2	0	Intermittent light work.
Foreman fire cleaners	1	12	10	2	0	Intermittent heavy work.
Fire cleaners	3	12	10	2	0	Do.
Coal handlers	2	12	10	2	0	Intermittent light work.
Coal handlers and coke grinder	1	12	10	2	0	Do.
Coke drier and sacker	2	10	9	1	0	
Total	19	82	71	11	0	
Charging floor and furnace.						
Senior melter	2	12	12	0	0	Supervision.
Junior melter	2	12	12	0	0	Do.
First helper	16	12	6	6	0	Intermittent heavy hot work.
Second helper	16	12	7	5	0	Do.
Third helper	12	12	7	5	0	Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

OPEN-HEARTH DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
***Charging floor and furnace*—Continued.**						
Pullups	8	12	7	5	0	Intermittent light work.
Floor cranemen	4	12	9	3	0	Do.
Charge machine man	4	12	8	4	0	Do.
Door and spout liner	1	10	9	1	0	Lunch hour.
General floor labor	10	12	10	2	0	Intermittent light work.
Spout liner helpers	2	12	10	2	0	Do.
Charging car spout setter	2	12	7	5	0	Do.
Total	79	142	104	38	0	
Stock handlers.						
Stock foremen	2	12	11	1	0	Supervision.
Stockers	12	12	10	2	0	Intermittent heavy work.
S. G. engineers	4	12	9	3	0	Do.
S. G. switchmen	4	12	9	3	0	Intermittent work.
Stock weighmen	2	12	9	3	0	Do.
Total	24	60	48	12	0	
General labor.						
General labor foreman	1	10	9	1	0	Supervision.
General laborers	10	10	9	1	0	Intermittent work.
Total	11	20	18	2	0	
Casting and stripping.						
General pit foreman	1	12	12	0	0	Supervision.
Pit foremen	2	12	12	0	0	Do.
N. G. foreman	2	12	12	0	0	Do.
Stopper setter	2	12	10	2	0	Intermittent work.
Stopper setter helper	2	12	10	2	0	Do.
Steel pourer	4	12	10	2	0	Do.
First ladleman	4	12	10	2	0	Do.
Second ladleman	6	12	10	2	0	Do.
Table men	8	12	10	2	0	Do.
Cinder pit men	22	12	11	1	0	Heavy work.
Ladle craneman	6	12	10	2	0	Intermittent work.
N. G. engineers	10	12	9	3	0	Do.
N. G. switchmen	10	12	9	3	0	Do.
Stripper craneman	2	12	8	4	0	Do.
Extra cranemen	1	12	.....	.....	.....	Abolished.
Stripper laborers	2	12	11	1	0	Intermittent work.
Ingot mold tarrer	2	12	(1)	(1)	.....	Do.
First ladle liner	1	10	9	1	0	Do.
Second ladle liner	1	10	(1)	(1)	.....	Do.
Ladle liners helper	3	10	9	1	0	Do.
Stopper maker	1	10	9	1	0	Do.
Stopper maker helper	1	10	9	1	0	Do.
Test carrier	2	12	8	4	0	Do.
Cranemen old O. H. building	2	12	10	2	0	Do.
Crane hooker	1	12	10	2	0	Do.
Crane hooker helper	3	12	10	2	0	Do.
Total	103	302	250	38	0	
Mechanical.						
Master mechanic	1	12	12	0	0	Supervision.
Millwright foreman	1	12	10	2	0	Intermittent work.
Do	1	12	10	2	0	Do.
Millwrights	4	12	10	2	0	Do.
Millwrights helpers	4	12	10	2	0	Do.
Pipe fitters	1	12	10	2	0	Do.
Do	1	12	10	2	0	Do.
Do	2	12	10	2	0	Do.
Do	1	12	10	2	0	Do.

(1) Abolished.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

MIXER, CUPOLA, AND CONVERTER DEPARTMENTS—Continued.

Occupation.	Number of men.	Hours. In turn.	Hours. Actual work.	Hours. Rest.	Hours. Spelled.	Remarks.
Blast force ladle cleaning house.						
Cranemen	2	12	9	3	0	Variable delivery of metal.
Foremen and weighmen	2	12				
Locomotive engineer	2	12	10	2	0	Do.
Laborers (ladle spotters)	4	12	10	2	0	
Total	10	48	29	7	0	

BLOOMING AND RAIL MILL DEPARTMENT.

General B. M. and R. M.						
Superintendent	1	10	10	0	0	Supervision.
Assistant superintendent	1	12	12	0	0	Do.
Do	1	12	12	0	0	Do.
Clerks	1	10	8	2	0	Light work.
Do	1	10	8	2	0	Do.
Labor foreman	1	12	12	0	0	Supervision.
Do	1	12	12	0	0	Do.
Special clerk	1	10	8	2	0	Light work.
Delay men	2	12	10	2	0	Do.
Sweeper, superintendent's office	1	12	10	2	0	Intermittent light work.
Total	11	112	102	10	0	
Blooming mill.						
Turn foremen	2	12	12	0	0	Supervision.
Soaking pit recorder	2	12	10	2	0	Intermittent confining work.
Heat boys	2	12	8	4	0	Do.
Total	6	36	30	6	0	
Gas producers.						
Foreman	1	12	12	0	0	Supervision.
Do	1	12	12	0	0	Do.
Gas makers	8	12	10	2	0	Intermittent heavy work.
Coal passers	1	12	10	2	0	Do.
Fire cleaners	4	12	10	2	0	Do.
Ash rollers	4	12	10	2	0	Do.
Total	19	72	64	8	0	
Charging and heating.						
Heaters	2	12	12	0	0	Hot, confining work.
Assistant heaters	2	12	12	0	0	Do.
Cranemen	4	12	9	3	0	Delays in operation.
Bottom makers	3	12	8	4	0	Heavy, intermittent hot work.
Bottom makers' helpers	3	12	8	4	0	Do.
Coke rollers	2	12	11	1	0	Intermittent work.
Door boys	6	12	10	2	0	Do.
Stamper and sweepers	4	12	10	2	0	Do.
Total	26	96	80	16	0	
Rolling and shearing.						
Ingot car engineers	2	12	9	3	0	Delays in operation.
Rollers	2	12	9	3	0	Do.
Engineers	2	12	9	3	0	Do.
Manipulators	2	12	9	3	0	Do.
Wrenchers	2	12	9	3	0	Do.
Engine oilers	2	12	10	2	0	Do.
Mill oilers	2	12	10	2	0	Do.
Do	2	12	10	2	0	Do.
Shear recorders	2	12	10	2	0	Do.
Shear foremen	2	12	12	0	0	Do.
Shear operators	2	12	9	3	0	Do.
Table operators	2	12	9	3	0	Do.
Hookers	2	12	9	3	0	Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BLOOMING AND RAIL MILL DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
***Rolling and shearing*—Contd.**						
Scale pit men	2	12	8	4	0	Heavy, intermittent work.
Do	3	12	8	4	0	Do.
Mill sweeper	1	12	11	1	0	Intermittent light work.
Approach table men	2	12	9	3	0	Do.
B. M. cranemen	2	12	8	4	0	Do.
Steel stampers	2	12	9	3	0	Do.
Total	38	228	177	51	0	
Hot beds.						
Foremen	2	12	12	0	0	Supervision.
Cranemen	4	12	8	4	0	Intermittent light work.
Loaders	8	12	8	4	0	Intermittent heavy, hot work.
Laborers	8	12	8	4	0	Do.
Total	22	48	36	12	0	Do.
Axle, bloom, and billet yard.						
Foreman and billet inspector	1	11	11	0	0	Supervision.
Chippers	18	11	10	1	0	Steady, heavy work.
Stamper	1	11	10	1	0	Light intermittent work.
Total	20	33	31	2	0	
Rail mill.						
Heaters	2	12	12	0	0	Heavy, hot work.
Furnace pushers	2	12	8	4	0	Intermittent work.
Firemen	8	12	10	2	0	Heavy, hot work.
Ash wheelers	2	12	11	1	0	Do.
Coal rollers	2	12	11	1	0	Do.
Reheating furnace recorder	2	12	8	4	0	Intermittent work.
Total	18	72	60	12	0	
Rolling and sawing.						
Rollers	2	12	12	0	0	Continuous light work.
Assistant rollers	2	12	12	0	0	Do.
Rough table levermen	2	12	9	3	0	Delays in operation.
First edger tablemen	2	12	9	3	0	Do.
Second edger tablemen	2	12	9	3	0	Do.
Finishing table levermen	2	12	9	3	0	Do.
Guide setter	4	12	9	3	0	Do.
Guide setter helper	2	12	9	3	0	Do.
Mill greasers	2	12	10	2	0	Do.
Roughing engineers	2	12	9	3	0	Do.
Roughing engine oiler	2	12	10	2	0	Do.
Rail train engineer	2	12	10	2	0	Do.
Mill oiler tables	2	12	10	2	0	Do.
Butt pullers	6	12	10	2	0	Do.
Tally boy	2	12	9	3	0	Do.
Stamper	2	12	9	3	0	Do.
Extra leverman speller	2	12	(1)	(1)	.....	Do.
Cranemen	2	12	8	4	0	Do.
Hot saw levermen	2	12	9	3	0	Do.
Hot saw grinder	1	12	10	2	0	Intermittent light work.
Hot saw oiler	2	12	10	2	0	Do.
Riggers	2	12	10	2	0	Intermittent work.
Guide chaser	2	12	10	2	0	Do.
Laborers	10	12	10	2	0	Do.
Sweeper	2	12	10	2	0	Do.
Riggers helper	2	12	10	2	0	Do.
Rail stop levermen	2	12	(1)	(1)	.....	Do.
Total	67	324	242	58	0	

[1] Abolished.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BLOOMING AND RAIL MILL DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
Rail finishing mill.						
Superintendent	1	10	10	0	0	Supervision.
Superintendent clerk	1	10	8	2	0	Intermittent light work.
Rail stock yard clerk	1	10	8	2	0	Do.
Turn foreman	2	12	12	0	0	Supervision.
Assistant turn foremen	2	12	12	0	0	Do.
Rail bank foreman	1	12	12	0	0	Do.
Assistant rail bank foremen	1	12	12	0	0	Do.
Tallyman	2	12	10	2	0	Intermittent light work.
Hotbed foremen	2	12	9	3	0	Intermittent work.
Hotbed straighteners	4	12	10	2	0	Delay in operation.
Hotbed greasers	2	12	10	2	0	Do.
Finishing mill oiler	2	12	10	2	0	Do.
Rail straighteners	12	12	10	2	0	Heavy, hard work.
Gaggers	12	12	10	2	0	Do.
Straighteners helpers	12	12	10	2	.....	Do.
Chippers	24	12	10	2	0	Do.
Hotbed levermen	6	12	9	3	0	Intermittent light work.
Drillers	24	12	10	2	0	Heavy, hard work.
Drillers' helpers	24	12	10	2	0	Do.
Dumpers	8	12	9	3	0	Intermittent work.
Ender men	12	12	10	2	0	Heavy, hard work.
Roller linemen	6	12	9	3	0	Do.
Pull ups	6	12	9	3	0	Do.
Dock cranemen	3	12	10	2	0	Intermittent work.
Crane followers	2	12	10	2	0	Do.
Loaders	14	12	10	2	0	Do.
Car stacker	1	12	10	2	0	Do.
Pilers and stackers	4	12	10	2	0	Do.
Sweepers	2	10	9	1	0	Do.
Total	193	340	288	52	0	
Finishing mill cold saw.						
Cold-saw foreman	1	12	12	0	0	Supervision.
Cold sawyer	1	12	10	2	0	Intermittent work.
Chippers	2	12	10	2	0	Do.
Drillers	2	12	10	2	0	Do.
Restraightener	1	12	10	2	0	Do.
Restraightener helper	1	12	10	2	0	Do.
Gagger	1	12	10	2	0	Do.
Loaders	4	12	10	2	0	Do.
Unloaders	2	12	10	2	0	Do.
Laborers	7	12	10	2	0	Do.
Total	22	120	102	18	0	
Boilers (over both plants).						
Foreman	1	12	12	0	0	Supervision.
Do	1	12	12	0	0	Do.
Water tenders	2	12	12	0	0	Continuous, light work.
Boiler-reamer	1	12	10	2	0	Irregularity of boiler working.
Boiler washer	1	12	10	2	0	Do.
Boiler washer's helper	1	12	10	2	0	Do.
Coal dumpers	9	12	10	2	0	Intermittent work.
Boiler reamer's helper	1	12	10	2	0	Irregularity of boiler working.
Total	17	96	86	10	0	
Cahall boilers.						
First fireman	2	12	10	2	0	Intermittent work.
Firemen	26	12	10	2	0	Do.
Firecleaners	2	12	10	2	0	Do.
Firecleaners' helpers	2	12	10	2	0	Do.
Ashpit men	2	12	10	2	0	Do.
Ashpit men helpers	6	12	10	2	0	Do.
Total	40	72	60	12	0	

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BLOOMING AND RAIL MILL DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
Stirling boilers.						
Firemen	4	12	10	2	0	Intermittent work.
Coal hoist operator	4	12	10	2	0	Do.
Ashpit men	1	12	10	2	0	Do.
Ashpit men helpers	2	12	10	2	0	Do.
Total	11	48	40	8	0	
Pump house.						
Pumpers	2	12	12	0	0	Intermittent work.
Air compressor men	2	12	12	0	0	Do.
Filter pump men	2	12	12	0	0	Do.
Total	6	36	36	0	0	
Mechanical general.						
Master mechanic	1	10	10	0	0	Supervision.
Millwright foremen	1	12	12	0	0	Intermittent work.
Do	1	12	12	0	0	Do.
Engine machinist	1	11	10	1	0	Delay incident to mechanical condition.
Machinist helpers	1	10	9	1	0	Do.
Machinists	1	10	9	1	0	Do.
Pipe fitters	2	12	9	3	0	Intermittent work.
Pipe fitters helpers	2	12	9	3	0	Do.
Babbitt men	1	10	9	1	0	Do.
Babbitt men helpers	1	10	9	1	0	Do.
Material chaser	1	10	8	2	0	Intermittent, light work.
Tool man	1	10	9	1	0	Do.
Motor inspector	2	12	12	0	0	Do.
Hydraulic valve men	1	11	9	2	0	Do.
Hydraulic valve men helpers	1	11	9	2	0	Do.
Total	18	163	145	18	0	
Soaking pit and gas production, mechanical.						
Millwrights	1	10	9	1	0	Intermittent work.
Blooming mill, mechanical.						
Millwrights	2	12	8	4	0	Intermittent heavy work.
Millwrights' first helpers	2	12	8	4	0	Do.
Millwrights' second helpers	2	12	8	4	0	Do.
Motor tender	2	12	8	4	0	Intermittent light work.
Total	8	48	32	16	0	
Rail mill, mechanical.						
Millwrights	4	12	8	4	0	Intermittent heavy work.
Millwrights' helpers	4	12	8	4	0	Do.
Motor tender	2	12	8	4	0	Do.
Total	10	36	24	12	0	
Finishing mill, mechanical.						
Millwrights	1	12	10	2	0	Intermittent work.
Do	1	12	10	2	0	Do.
Millwrights' helpers	2	12	10	2	0	Do.
Drill grinders	1	10	8	2	0	Intermittent light work.
Motor tender	4	12	10	2	0	Do.
Total	9	58	48	10	0	

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BLOOMING AND RAIL MILL DEPARTMENT—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
Inspecting.						
Chief inspector	1	10	10	0	0	Supervision.
Assistant inspector	1	12	12	0	0	Do.
Inspector's clerk	2	12	10	2	0	Intermittent light work.
Section inspector	2	12	10	2	0	Do.
Drop test men	2	12	10	2	0	Do.
Inside inspector	3	12	10	2	0	Do.
Outside inspector	3	12	10	2	0	Do.
Extra inspector	1	12	10	2	0	Do.
Total	20	94	82	12	0	
Roll shop.						
Superintendent roll shop	1	10	10	0	0	Supervision.
Roll designer	1	10	10	0	0	Do.
Foreman	1	10	10	0	0	Do.
Roll turners	9	10	9	1	0	Interruptions incident to mechanical work.
Do	1	12	10	2	0	Do.
Roll turners under instruction	1	10	9	1	0	Do.
Do	1	12	11	1	0	Do.
Templet maker	1	10	9	1	0	Do.
Templet maker apprentice	1	10	9	1	0	Do.
Machinists	1	10	9	1	0	Do.
Do	1	12	11	1	0	Do.
Toolmaker	1	10	9	1	0	Do.
Craneman and roll brander	1	10	8	2	0	Intermittent work.
Roll ragger	1	10	9	1	0	Do.
Laborer	1	10	9	1	0	Do.
Do	1	12	11	1	0	Do.
Do	2	10	9	1	0	Do.
Total	25	168	152	16	0	

BESSEMER ROLLING MILLS.

16-inch bar mill.						
Heaters	4	12	8	4	0	Waiting for steel to heat.
Heaters' helpers	4	12	8	4	0	Do.
Chargers	4	12	8	4	0	Waiting for steel to heat and drawn.
Chargers' helpers	8	12	8	4	0	Waiting for steel to heat.
Run down	4	12	6	6	0	Waiting for steel and waiting to draw other force (one man to a furnace).
Roller	2	12				
Finisher	2	12	9	3	0	Waiting for steel to heat.
Catchers	2	12	9	3	0	Do.
Roughers	6	12	6	3	3	Waiting for steel and rest one-third of the time mill is operating.
Roughing hook	2	12	9	3	0	Waiting for steel to heat.
Finishing hook	2	12	9	3	0	Do.
Front hook	2	12	9	3	0	Do.
Second finisher	2	12	9	3	0	Do.
Drag outs	6	12	9	3	0	Do.
Straighteners	2	12	9	3	0	Do.
Cinder tapper and scale cleaner	2	12	9	3	0	Do.
Engineer for bar and guide mill	2	12				
Scrap man	1	12	9	3	0	Waiting for the shears.
Truckmen	8	12	8	4	0	Do.
Shearmen	2	12	8	4	0	Waiting for steel to heat.
Shearmen helpers	2	12	8	4	0	Do.
Tail-end men	2	12	8	4	0	Do.
Conveyor men	4	12	8	4	0	Do.
Stockers	8	12	10	2	0	Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

BESSEMER ROLLING MILLS—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn	Actual work.	Rest.	Spelled.	
8-inch guide mill.						
Heater	2	12	9	3	0	Waiting for steel to heat.
Heaters' helpers	2	12	9	3	0	Do.
Chargers	2	12	9	3	0	Do.
Run down	2	12	9	3	0	Do.
Roller	2	12				
Roughers	6	12	6	3	3	Waiting for steel and rest one-third of the time mill is operating.
Finisher	2	12	9	3	0	Waiting for steel to heat.
Catchers	2	12	6	3	0	Do.
Stranders	2	12	9	3	0	Do.
Pony roughers	2	12	9	3	0	Do.
Spell men	2	12	9	6	0	Do.
Straighteners	4	12	9	3	0	Do.
Shearmen	2	12	9	3	0	Do.
Shearmen helpers	2	12	9	3	0	Do.
Bundlers	2	12	9	3	0	Do.
Gaugers	2	12	9	3	0	Do.
Scrapmen	1	12	9	3	0	Waiting for the shears.
Engineers, 10-inch engine	2	12	9	3	0	Waiting for steel to heat, etc.
Cinder tappers and scale cleaners	2	12	9	3	0	Do.
Truckmen	4	12	10	2	0	Waiting for the shears.
Stockers	6	12	10	2	0	Waiting for steel to heat.
28-inch plate mill.						
Locomotive cranemen	2	12	7	5	0	Waiting for steel.
Hookouts	2	12	7	5	0	Do.
Unhookers	2	12	7	5	0	Do.
Stockers	4	12	9	3	0	Waiting on furnace.
Transfer boys	2	12	8	4	0	Do.
Heaters, old furnace	2	12	8	4	0	Do.
Heater helpers	2	12	8	4	0	Do.
Drawers	2	12	8	4	0	Do.
Run-downs	2	12	8	4	0	Do.
Chainmen	2	12	8	4	0	Do.
Hook men	2	12	8	4	0	Do.
Cinder tappers and sand wheelers	2	12	6	6	0	Waiting on furnace, etc.
Heaters, new furnace	2	12	9	3	0	Waiting on furnace.
Rollers	2	12	10	2	0	Do.
First roughers	2	12	10	2	0	Do.
Second roughers	2	12	10	2	0	Do.
Third roughers	2	12	10	2	0	Do.
First catchers	2	12	10	2	0	Do.
Second catchers	2	12	10	2	0	Do.
Screw downs	2	12	10	2	0	Do.
Measurers	2	12	10	2	0	Do.
Table men	2	12	10	2	0	Do.
Straighteners	2	12	10	2	0	Do.
Annealers	2	12	10	2	0	Do.
Plate drag outs	8	12	10	2	0	Do.
Engineers	2	12	10	2	0	Do.
Engineer assistants	2	12	10	2	0	Do.
Salt boys	2	12	10	2	0	Do.
Chargers	2	12	9	3	0	Do.
Crane operators	2	12	9	3	0	Do.
Markers	2	12	11	1	0	Do.
Truckmen	12	12	11	1	0	Do.
Shearmen	2	12	11½	½	0	Do.
Markers	2	12	11½	½	0	Do.
First helpers	2	12	11½	½	0	Do.
Second helpers	2	12	11½	½	0	Do.
Third helpers	6	12	11½	½	0	Do.
Scrapmen	2	12	11½	½	0	Waiting on the shearman.
Drag-up men	4	12	11½	½	0	Waiting on furnace.
Drag-up engineers	2	12	11½	½	0	Do.
Scrap shearmen	2	12	9	3	0	Waiting on shearmen.
Scrap wheelers	2	12	9	3	0	Do
Extra shear gang, plate mill.						
Shearman	1	10	8	2	0	Waiting on furnace.
Marker	1	10	8	2	0	Do.
Helpers	6	10	8	2	0	Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

FOUNDRY FURNACE DIVISION.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
First and second forces.						
Stock house:						
Foremen	2	12	12	.....	.....	Supervising.
Scalemen	4	12	10½	1½	.....	Filling caught up with.
Top fillers	4	12	10½	1½	.....	Do.
Top fillers' helpers	4	12	10½	1½	.....	Do.
Cagers	4	12	10½	1½	.....	Do.
Ore rollers	12	12	10½	1½	.....	Do.
Lime rollers	4	12	10½	1½	.....	Do.
Coke rollers	24	12	10½	1½	.....	Do.
Sweepers and greasers	4	12	10½	1½	.....	Do.
Stock dumpers	2	10	8	2	.....	Task work.
Scrappers	4	12	10½	1½	.....	Filling caught up with.
Cast house:						
Foundrymen	2	12	12	.....	.....	Supervising.
Stove tenders	4	12	9	3	.....	Between changes.
Keepers	4	12	8	4	.....	Work caught up with.
First helpers	4	12	8	4	.....	Do.
Second helpers	4	12	8	4	.....	Do.
Third helpers	4	12	8	4	.....	Do.
Fourth helpers	4	12	8	4	.....	Do.
Sweepers	3	10	8	2	.....	Do.
Scrappers	4	12	8	4	.....	Do.
Cinder snappers	4	12	8	4	.....	Do.
Stove repairer	1	10	10	.....	.....	
Stove repairer helper	1	10	10	.....	.....	
Clay man	1	10	10	.....	.....	
Iron yard:						
Foreman	1	10	10	.....	.....	Supervising.
Iron carriers	11	12	8	4	.....	Task work.
Shed breakers	6	12	8	4	.....	Do.
Yard breakers	3	10	8	2	.....	Do.
Graders	1	10	8	2	.....	Do.
Head off bearers	2	10	8	2	.....	Do.
Off bearers	10	10	8	2	.....	Do.
Sand man	1	10	8	2	.....	Do.
Drivers	3	10	8	2	.....	Do.
Engine room:						
Blowing engineers	2	12	12	.....	.....	Light intermittent work.
Assistant blowing engineers	2	12	12	.....	.....	Do.
Engine wiper	1	12	12	.....	.....	Do.
Boilers:						
Foremen	1	10	10	.....	.....	Supervising.
Water tender	2	12	12	.....	.....	Light intermittent work.
Firemen	4	12	12	.....	.....	Do.
Coal and ash roll	2	12	12	.....	.....	Do.
Boiler reamers	2	10	10	.....	.....	Do.
Reamers helpers and boiler washers.	4	10	10	.....	.....	Do.
Boiler blowers	4	10	10	.....	.....	Do.
Electrical:						
Electrician	1	10	10	.....	.....	
Floating gang:						
Foreman	1	10	10	.....	.....	Supervising.
Hot pot cleaner	1	10	10	.....	.....	
Hot pot cleaner helper	1	10	10	.....	.....	
Ditch digger	1	10	10	.....	.....	
Cartmen	2	10	10	.....	.....	
Stableman	1	10	10	.....	.....	
Laborers	10	10	10	.....	.....	
Watchman	1	12	12	.....	.....	
Three and four forces.						
Office and laboratory:						
Sampler	1	10	8	2	.....	
Stenographer	1	10	8	2	.....	
Messenger	1	10	8	2	.....	
Steam plant:						
Foreman	1	10	10	.....	.....	Supervising.
Water tenders	2	12	12	.....	.....	Light intermittent work.
Firemen	4	12	12	.....	.....	Do.
Boiler blowers	2	10	10	.....	.....	Do.
Boiler cleaners	4	10	10	.....	.....	Do.
Cartmen	2	10	10	.....	.....	Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

FOUNDRY FURNACE DIVISION—Continued.

Occupation.	Number of men.	Hours. In turn.	Actual work.	Rest.	Spelled.	Remarks.
Three and four forces—Contd.						
Stock house:						
Foreman	1	12	12			Supervising.
Do	1	12	10½	1½		Rest account force being full.
Scalemen	4	12	10½	1½		Do.
Top fillers	4	12	10½	1½		Do.
Top fillers helpers	4	12	10½	1½		Do.
Ore rollers	12	12	10½	1½		Do.
Lime rollers	4	12	10½	1½		Do.
Coke rollers	24	12	10½	1½		Do.
Cagers	4	12	10½	1½		Do.
Sweepers and greasers	4	12	10½	1½		Do.
Stock dumpers	2	12	8	4		Taskwork.
Scrap men	2	12	10½	1½		Account furnace being full.
Cast house:						
Foundrymen	2	12	12			Supervising.
Stove tenders	4	12	9	3		Between changes.
Keepers	4	12	8	4		Work caught up with.
First helpers	4	12	8	4		Do.
Second helpers	4	12	8	4		Do.
Third helpers	4	12	8	4		Do.
Fourth helper	4	12	8	4		Do.
Clay man	1	10	8	2		Do.
Sweepers	3	10	8	2		Do.
Scrappers	4	12	8	4		Do.
Cinder snappers	6	12	8	4		Do.
Stove repairer	1	10	10			
Stove repairer helper	1	10	10			
Open sand moulder	1	10	10			
Iron yard:						
Foremen	1	10	10			Supervising.
Iron carriers	10	12	8	4		Task work.
Shed breaker	6	12	8	4		Do.
Yard breaker	4	10	8	2		Do.
Graders	4	10	8	2		Do.
Off bearer	6	10	8	2		Do.
Sand and scrap man	2	10	10			
Scaleman	1	10	10			
Iron loaders	4	10	9	1		Waiting on car shifts.
Engine room:						
Blowing engineer	2	12	12			Light intermittent work.
Blowing engineer helper	2	12	12			Do.
Floating gang:						
Foreman	1	10	10			Supervising.
Hot pot cleaner	1	10	10			
Hot pot cleaner helper	1	10	10			
Cartmen	2	10	10			
Laborer	9	10	10			
Watchman	1	10	10			
Stable boss	1	10	10			
Teamster	1	10	10			
Alice furnace.						
Office and laboratory:						
Chemist	1	10	8	2		
Sampler	1	10	8	2		
Messenger	1	10	8	2		
Steam plant:						
Head firemen	1	12	12			Light intermittent work.
Water tender	2	12	12			Do.
Firemen	1	12	12			Do.
Boiler blowers	4	10	10			
Ash rollers	1	12	8	4		Work caught up with.
Coal rollers	1	12	8	4		Do.
Stock house:						
Foremen	2	12	12			Supervising.
Scale man	1	12	10½	1½		Filling caught up with.
Top fillers	2	12	10½	1½		Do.
Top-fillers' helpers	8	12	10½	1½		Do.
Ore rollers	6	12	10½	1½		Do.
Lime rollers	2	12	10½	1½		Do.
Coke rollers	4	12	10½	1½		Do.
Cagers	4	12	10½	1½		Do.

Tennessee Coal, Iron and Railroad Co., Ensley Works, statement showing rest hours of fixed occupations, Sept. 28, 1911—Continued.

FOUNDRY FURNACE DIVISION—Continued.

Occupation.	Number of men.	Hours.				Remarks.
		In turn.	Actual work.	Rest.	Spelled.	
Alice furnace—Continued.						
Stock house—Continued.						
Sweepers and greasers	2	12	10 1/12	1 1/12	.....	Filling caught up with.
Stock dumper	1	12	8	4	.....	Task work.
Stock-dumper's helper	1	12	8	4	.....	Do.
Coke drivers	2	12	10 1/12	1 1/12	.....	Filling caught up with.
Scrap men	4	12	10 1/12	1 1/12	.....	Do.
Cast house:						
Foundrymen	2	12	12	.....	.....	Supervising.
Stove tenders	2	12	9	3	.....	Between changes.
Keepers	2	12	10	2	.....	Work caught up with.
First helpers	2	12	10	2	.....	Do.
Second helpers	2	12	10	2	.....	Do.
Third helpers	2	12	10	2	.....	Do.
Clay man	1	10	8	2	.....	Do.
Cinder snappers	2	12	10	2	.....	Do.
Wallow men	2	12	10	2	.....	Do.
Stove repairer	1	10	10	.....	.....	
Scrappers	2	12	8	4	.....	Do.
Iron yard:						
Foreman	1	10	10	.....	.....	Supervising.
Head shed breakers	2	12	8	4	.....	Task work.
Shed breakers	4	12	8	4	.....	Do.
Head iron carriers	2	12	8	4	.....	Do.
Iron carriers	6	12	8	4	.....	Do.
Engine room:						
Blowing engineers	2	12	12	.....	.....	Light intermittent work.
Blowing-engineers' helpers	2	12	12	.....	.....	Do.
Grease wiper	1	12	12	.....	.....	Do.
Floating gang:						
Fireman and mold r	1	10	10	.....	.....	
Cartman	1	10	10	.....	.....	
Laborers	12	10	10	.....	.....	
Watchman	1	12	12	.....	.....	
Stableman	1	10	10	.....	.....	

NOTE.—Mechanics and carpenters not included.

TENNESSEE COAL, IRON & RAILROAD CO.,
Birmingham, Ala., September 29, 1911.

DEAR SIR: I hand you herewith statement showing rest periods of fixed occupations at the Ensley Mills, the Bessemer Rolling Mills, the Alice and Bessemer Furnaces. In the Ensley division we have not included the labor and mechanical departments, they being on a straight 10-hour basis; the rest periods for them are of very small significance. As I understand it, the information was intended to cover fixed occupations, and we have given it accordingly.

Yours, truly,

GEO. G. CRAWFORD, *President.*

Mr. J. A. FARRELL,
President United States Steel Corporation, 71 Broadway, New York.

Six-day schedule, Tennessee Coal, Iron & Railroad Co., January 24, 1912.

ALICE FURNACE.

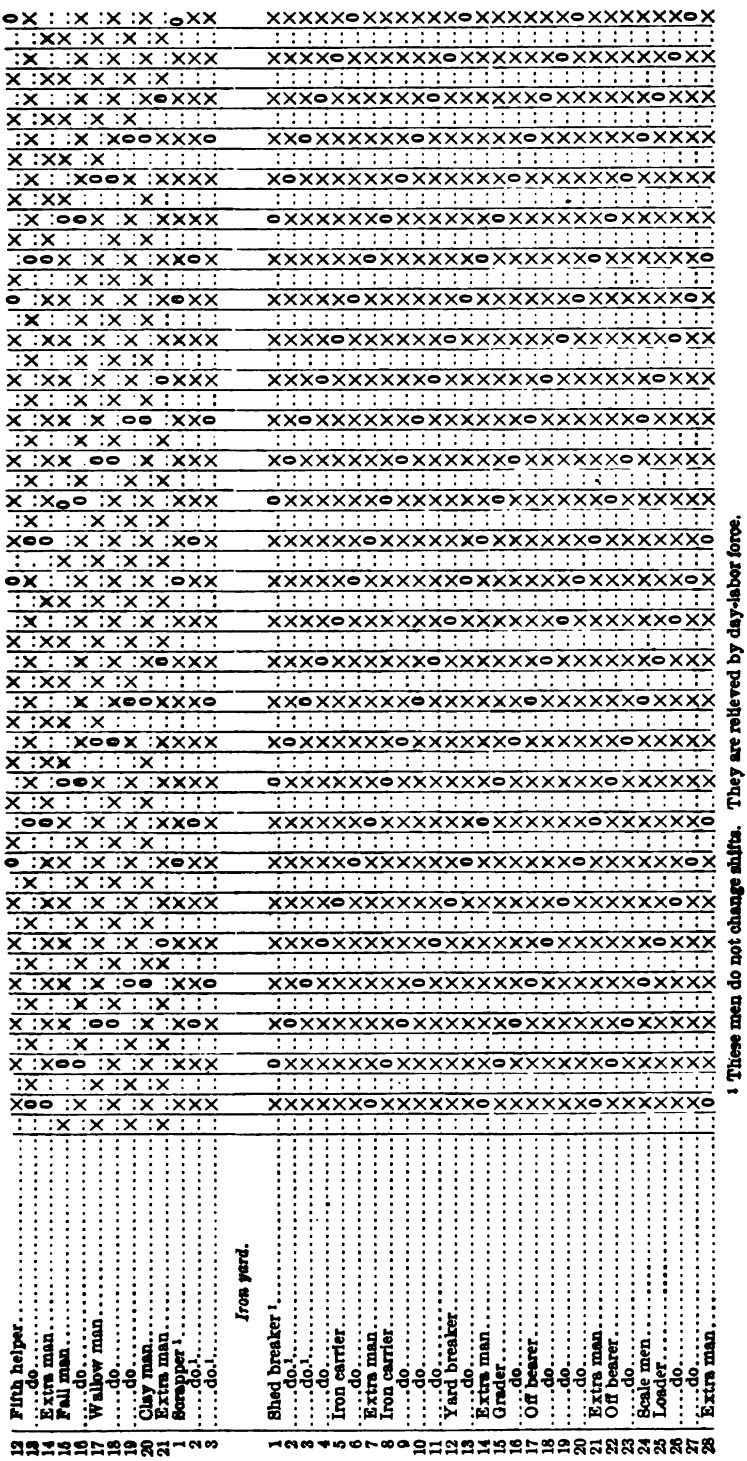
[N=night; D=day; ×=time worked; 0=time off.]

	Number and occupation.	First week.													Second week.													Third week.													Fourth week.												
		Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.		Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.		Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	
		N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D
	Foremen.																																																					
1	Day foreman	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×
2	Night foreman	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..
3	Day stock-house foreman	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	×
4	Night stock-house foreman	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..
5	Day stove man	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×
6	Night stove man	0	..	×	..	×	..	×	..	×	..	×	..	×	0	..	×	..	×	..	×	..	×	..	×	..	×	0	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..
7	Extra man	×	0	..	×	..	×	..	×	..	×	..	×	..	×	0	..	×	..	×	..	×	..	×	..	×	..	×	0	..	×	..	×	..	×	..	×	..	×	..	×	0	..	×	..	×	..	×	..	×	..	×	..	×	..
	Stock-house.																																																				
1	Scale man	×	..	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..
2	.....do	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
3	Top filler	×	..	×	..	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
4	.....do	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
5	Top-filler helper	×	..	×	..	×	..	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	..	0	×	..	×	..	×	..	×	..	×	..	×	..	..	0	×	..	×	..	×	..	×	..
6	.....do	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
7	Extra man	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
8	Top-filler helper	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
9	.....do	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
10	.....do	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
11	.....do	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	0
12	.....do	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	0	..
13	.....do	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	0	..	×	..	0	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
14	Extra man	..	0	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
15	Ore roller	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	×	..
16	.....do	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..
17	.....do	×	..	×	..	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
18	.....do	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
19	.....do	×	..	×	..	×	..	..	0	..	×	..	×	..	×	..	×	..	×	..	0	×	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
20	.....do	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..
21	Extra man	×	..	×	..	×	..	×	..	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..	×	..	0	..	×	..	×	..	×	..	×	..

Six-day schedule, Tennessee Coal, Iron & Railroad Co., January 24, 1912—Continued.

ALICE FURNACE—Continued.

	Number and occupation.	First week.													Second week.													Third week.													Fourth week.												
		Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	
		N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D
	***Stock-house*—Continued.**																																																			
22	Ore roller		X		X		X		X		0		X		X		X		X				0		X		X		X		X		X		X		X				0		X		X				X	
23	....do	X		X		X		X		X		0		X	X		X		X		X		X		0		X	X		X		X		X		X		0		X		X		X		0		X		X	
24	Coke roller		X		X		X		X		X		0	X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		0		X		X	
25	....do	X		X		X		X		X		0		X	X		X		X		X		X		0		X	X		X		X		X		X		0		X		X		X		0		X		X	
26	....do		X		X		X		X		X		0	X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		0		X		X	
27	....do		0	X		X		X		X		X		X		0	X		X		X		X		X		X		0	X		X		X		X		X			0	X		X		X		X		X		X	
28	Extra man		0		X		X		X		X		X			0	X		X		X		X		X		X		0		X		X		X		X			0	X		X		X		X		X		X	
29	Cager	X			0		X		X		X		X		X			0	X		X		X		X		X			0		X		X		X		X		X			0	X		X		X		X		X	
30	....do		X		0	X		X		X		X		X		X		0	X		X		X		X		X		X		0	X		X		X		X		X			0	X		X		X		X		X	
31	....do	X		X			0		X		X		X		X		X		0	X		X		X		X		X			0		X		X		X		X		X			0	X		X		X		X		X	
32	....do		X		X		0	X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X	
33	Sweeper	X		X		X			0		X		X		X		X		X		0	X		X		X		X		X		X		0	X		X		X		X		X		0	X		X		X		X	
34	....do		X		X		X		0	X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		0		X		X		X	
35	Extra man	X		X		X		X		0		X		X		X		X		X		0	X		X		X		X		X		X		0		X		X		X		X		0		X		X		X	
36	Driver		X		X		X		X		0	X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		0		X		X		X	
37	....do	X		X		X		X		X		0		X	X		X		X		X		0		X		X	X		X		X		X		0		X		X		X		0		X		X		X	
38	Scrapper		X		X		X		X		0	X		X		X		X		X		0	X		X		X		X		X		X		0	X		X		X		X		0	X		X		X		X	
39	....do	X		X		X		X		X		0		X	X		X		X		X		0		X		X	X		X		X		X		0		X		X		X		0		X		X		X	
40	....do		X		X		X		X		X		0	X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		0		X		X		X	
41	....do		0	X		X		X		X		X		X		0	X		X		X		X		X		X		0	X		X		X		X		X			0	X		X		X		X		X	
42	Extra man		0		X		X		X		X		X			0	X		X		X		X		X		X		0		X		X		X		X			0	X		X		X		X		X	
	Cast shed.																																																				
1	Keeper	X			0		X		X		X		X		X			0	X		X		X		X		X			0		X		X		X		X			0	X		X		X		X		X	
2	....do		X		0	X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X			0	X		X		X		X		X	
3	First helper	X		X			0	X		X		X		X	X		X		0	X		X		X		X	X		X		0	X		X		X		X			0	X		X		X		X		X	
4	....do		X		X		0	X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X			0	X		X		X		X		X	
5	Second helper	X		X		X			0		X		X		X		X		0	X		X		X		X		X			0		X		X		X		X			0	X		X		X		X		X	
6	....do		X		X		X		0	X		X		X		X		X		0		X		X		X		X		0		X		X		X		X			0	X		X		X		X		X	
7	Extra man	X		X		X		X		0		X		X	X		X		X		0	X		X		X		X		0		X		X		X		X			0	X		X		X		X		X	
8	Third helper	X		X		X		X		0	X		X		X		X		X		0		X		X		X		X		0		X		X		X			0	X		X		X		X		X	
9	....do	X		X		X		X		X		0		X	X		X		X		X		0		X		X		X		0		X		X		X			0	X		X		X		X		X	
10	Fourth helper		X		X		X		X		X		0	X		X		X		X		X		0		X		X		X		0		X		X		X			0	X		X		X		X		X	
11	....do	X		X		X		X		X		X		0	X		X		X		X		X		X	0		X		X		X		X		X		X			0	X		X		X		X		X	



[1] These men do not change shifts. They are relieved by day-labor force.

Six-day schedule, Tennessee Coal, Iron & Railroad Co., January 24, 1912—Continued.

ALICE FURNACE—Continued.

	Number and occupation.	First week.													Second week.												
		Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.		Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	
		N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D
	Engines and boilers.																										
1	Engineer		X		0	X		X		X		X		X				0		X		X		X		X		X	
2	Engineer helper	X		X			0		X		X		X		X			X		0	X		X		X		X		X
3	Engineer	X		X		X		X		0		X		X		X		X		X		0	X		X		X		X
4	Engineer helper		X		X		X		X		0		X		X		X		X		X		0		X		X		X
5	Water tender		X		X		X		0	X		X		X		X		X		X		0	X		X		X		X
6	.....do	X		X		X		X		X			0		X		X		X		X		0	X		X		X		0
7	Extra man		0		X		X		X		X		X		0	X		X		X		X		X		X		X	
	Foreman.																										
1	Day foundryman		X		0		X		X		X		X		X		X		0		X		X		X		X		X
2	Night foundryman	X		X		X		X		X		X	0		X		X		X		X		X		0		X		X	
3	Day stock house foreman		X		X		X		0		X		X		X		X		X		0		X		X		X		X
4	Night stock house foreman	X		X		X		X		0		X		X		X		X		X		0		X		X		X	
5	Day stove man		X		X		0		X		X		X		X		X		0		X		X		X		X		X
6	Night stove man	0		X		X		X		X		X		X		0		X		X		X		X		X		X	
7	Extra man	X	0		X		X		X		X		X		X	0		X		X		X		X		X		X	
	Stock house.																										
1	Scale man	X			0		X		X		X		X		X			0	X		X		X		X		X		X
2	.....do		X		0	X		X		X		X		X		X		0		X		X		X		X		X	
3	Top filler	X		X			0		X		X		X		X		X		0	X		X		X		X		X	
4	.....do		X		X		0	X		X		X		X		X		X		0		X		X		X		X	
5	Top filler helper	X		X		X			0		X		X		X		X		X		0	X		X		X		X	
6	.....do		X		X		X		0	X		X		X		X		X		X		0	X		X		X		X
7	Extra man	X		X		X		X		0		X		X		X		X		X		0	X		X		X		X	
8	Ore roller		X		X		X		X		0	X		X		X		X		X		0	X		X		X		X	
9	.....do	X		X		X		X		X		0	X		X		X		X		X		0	X		X		X		
10	.....do		X		X		X		X		0	X		X		X		X		X		0	X		X		X		X	
11	.....do	X		X		X		X		X		X		0		X		X		X		X		X		X		X		0	

BESSEMER FURNACES.

Six-day schedule, Tennessee Coal, Iron & Railroad Co., January 24, 1912—Continued.

BESSEMER FURNACES—Continued.

	Number and occupation.	First week.													Second week.													Third week.													Fourth week.												
		Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	Su.		Mo.		Tu.		We.		Th.		Fr.		Sa.	
		N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D
	Iron yard—Continued.																																																			
8	Iron carrier		X		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X	
9	....do		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X	
10	....do		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X	
11	....do		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		X		0		X	
12	Yard breaker		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		0		X	
13	....do		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		0		X	
14	Extra man		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X	
15	Graders		X		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X	
16	....do		X		X		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X	
17	Off bearer		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X	
18	....do		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X	
19	....do		X		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X	
20	....do		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X	
21	Extra man		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X	
22	Off bearer		X		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X	
23	....do		X		X		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X	
24	Scaleman		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X	
25	Scrapper		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X	
26	Loader		X		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0	
27	....do		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0	
28	Extra man		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X	
	Engines and boilers.																																																			
1	Engineer		X		0	X		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X	
2	Engineer helper	X		X			0		X		X		X		X		X		0	X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X	
3	Engineer	X		X		X		X		0		X		X	X		X		X		0	X		X		X		X		X		0		X		X		X		X		X		0		X		X		X	
4	Engineer helper		X		X		X		X		0		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X		X		0		X		X	
5	Water tender		X		X		X		0		X		X		X		X		0		X		X		0		X		X		X		0		X		X		X		X		X		0		X		X	
6	....do	X		X		X		X		0		X		X	X		X		X		X		X		0		X		X		X		0		X		X		X		X		X		0		X		X	
7	Extra man		0		X		X		X		X		X		0		X		X		X		X		X		X		0		X		X		X		X		X		0		X		X		X		X	

[Telegram, copy to W. P. Palmer, Cleveland.]

UNITED STATES STEEL CORPORATION,
Pittsburgh, February 7, 1912.

C. L. CLOSE, *New York:*

Answering message to Palmer, statement his letter October 23 to you still holds good. Percentage men employed working regularly 12 hours a day, entire company approximately 20 per cent blast furnaces, and steel works 65 per cent. Majority producing labor open-hearth, Bessemer, and blooming mills begin work 6 p. m. Sundays, 1 Saturday afternoon. Rod mill and majority mechanics and laborers begin 6 m. Monday, end 6 p. m. Saturday. Majority producing labor these departments rk 12 hours, small number 8 hours, mechanics and laborers 10 hours. Labor rate ittsburgh 17½ cents, Cleveland 17 cents. Average daily wages December, 1911, essemer $2.47, open-hearth $2.97, blooming mills $3.01, rod mill $3.69. Bessemer verage low, due to reduced tonnage one plant. Rod mill apparently high, due to larger proportion tonnage men than in figures of other departments.

C. L. MILLER.

[Telegram.]

UNITED STATES STEEL CORPORATION,
New York, N. Y., February 7, 1912.

WM. P. PALMER,
President American Steel & Wire Co., Western Reserve Building, Cleveland, Ohio:

Will you please send me to-day, if possible, the time of day for starting and stopping weekly turns, separately, in the following departments: Open hearth, Bessemer, rolling mill, and finishing mills? Would also like number of hours constituting day's work, the labor wage, and the average daily wage for these departments.

C. L. CLOSE.

[Telegram.]

UNITED STATES STEEL CORPORATION, *February 7, 1912.*

W. P. PALMER,
President American Steel & Wire Co., Western Reserve Building, Cleveland, Ohio:

Are there any modifications or changes to make in your statement, letter October 23, regarding 6-day week labor? I would like to have percentage of total men employed working regularly 12 hours a day.

C. L. CLOSE.

OFFICE OF PRESIDENT AMERICAN STEEL & WIRE CO.,
Cleveland, October 23, 1911.

Mr. C. L. CLOSE,
Committee of Safety, United States Steel Corporation, New York.

DEAR SIR: Your letter of 20th instant received. In reply I inclose copy of letter we are sending this day to Mr. James T. McCleary, secretary, American Iron & Steel Institute.

Trusting that this will be satisfactory.

Yours, truly, WM. P. PALMER, *President.*

CLEVELAND, *October 23, 1911.*

Mr. JAMES T. MCCLEARY,
Secretary, American Iron & Steel Institute, 30 Church Street, New York.

MY DEAR SIR: In reply to your letter of October 21, desire to say that in our blast furnace and steel works we are carrying out to the letter the recommendations of the committee, in reference to the elimination of the seven-day week.

The wire mills needed little attention in this direction.

Yours, truly, W. P. P., *President.*

(Copy to Mr. C. L. Close, committee of safety.)

OFFICE PRESIDENT, AMERICAN STEEL & WIRE CO.,
Cleveland, October 9, 1911.

Mr. J. A. FARRELL,
President, United States Steel Corporation, New York.

MY DEAR MR. PALMER: Noting your letter of August 31 in reference to rest periods enjoyed by the men in the various occupations in our works, desire to say that we have gone into the matter very fully.

It is somewhat difficult, as Mr. Miller explains, to estimate this in some lines of our work. We have done our best, to give a fair statement of the case. The data inclosed are submitted to you for your information. I have thought best also to inclose Mr. Miller's letter, which explains in detail some features of the proposition.

Yours, truly,

WM. P. PALMER, *President.*

OFFICE VICE PRESIDENT AND GENERAL SUPERINTENDENT,
AMERICAN STEEL & WIRE CO.,
Pittsburgh, Pa., October 8, 1911.

Mr. A. S. CHISHOLM,
Assistant to President, Cleveland, Ohio.

DEAR SIR: Replying to your letter of September 6 in regard to Mr. Farrell's request for information on the rest periods enjoyed by the men in various occupations in our works. This particular question was made a feature of the special inquiry into the labor conditions in the steel industry conducted by the Bureau of Labor during the past year under a resolution of the United States Senate, and I presume that Mr. Farrell desires substantially the same information. Our reply is therefore limited to the same occupations as those investigated by the Bureau of Labor, comprising all employees at blast furnaces, steel works and rolling mills, including rod mills and departments auxiliary thereto, but not including wire mills or finishing departments.

The agents of the bureau made it a point at each plant visited to question the superintendents on this subject. Naturally for a majority of the occupations precise figures as to the proportion of the time during which the men are able to rest could not be given, and the superintendents gave their personal estimates based on their own observation and experience. In certain departments, such as the rolling mills, for which delay reports are kept showing exactly the time that the men directly working on the mills are idle, these reports were submitted to the agents to verify the superintendent's estimates. Again for a number of positions "spell hands" are employed, and in such cases the rest period is definitely known. Records were kept of the replies, and the attached statements are compiled from those records combining the answers for similar occupations at the several works into one figure which represents approximately the average of the several superintendent's estimates.

For many occupations this question is a very difficult one to answer. Take, for instance, the case of men in charge of rolling mill engines which run continuously at constant speed. Such men are required to be on duty and alert during the whole time that the mill is running, but there may be several hours during which no physical exertion is called for. As a rule such men have more actual work to do when the mill is shut down than when it is running. The answer to the question "How long such men have for rest?" depends on the definition of that word. It will be observed that the replies made by our steel works superintendents imply that these men are at work about 90 per cent of the time. The rod-mill superintendents as a rule did not state percentage, saying instead that the work was light and intermittent.

In the boiler houses the firemen, that is the men who actually tend the fires, are reported as occupied only 75 per cent of the time, while the water tenders, whose duties are chiefly supervisory, are said to be employed 100 per cent. It would be very misleading to draw the conclusion that a water tender's work is more arduous than that of a fireman. Mechanics of all trades are reported as working all the time, but it is well understood that that depends more on the individual than on anything else.

For the wire mills and finishing departments which are not covered in detail, it may be said in general that the condition is the same as with mechanics; that is, that the proportion of time occupied depends on the individual. A very large part of our employees in these departments are paid on this piecework basis, earnings being entirely dependent on individual effort.

Yours, truly,

C. L. MILLER,
Vice President and General Superintendent.

ESTIMATED PERCENTAGE OF ACTUAL WORKING HOURS IN ROD MILLS, AMERICAN STEEL & WIRE CO.

All employees working in direct connection with rod mills are on duty 12 hours. The mills, however, almost never are scheduled to run more than 11 hours, there being one or more recesses of at least an hour's duration for meals and for adjustment of the mills, this last requiring attention from only a part of the crew. In addition to these scheduled stops there are always delays for a variety of causes, which will aggregate half an hour on the average under the very best operating conditions, and may amount to considerably more. Thus, the actual running time of a rod mill is very seldom more than 10½ hours, or 87½ per cent. The positions involving heavy, constant, manual labor, nervous strain or exposure to intense heat, are double manned so that after a short period of work the man is relieved or "spelled" by another, and thus only works half the actual running time; or in some cases where one spell hand is employed for two or three positions two-thirds or three-fourths of the time. The principal occupations are listed below.

Roll hands.—Roughers and catchers are spelled as described above, except on continuous mills which are almost entirely automatic.

Heaters.—Men in charge of the continuous mechanically operated heating furnaces now in general use have very little actual work to perform, nor are they exposed except at occasional and rare intervals to intense heat. Their constant attendance is required, but they are not at work more than 75 per cent of the time. In the case of the old style hand-operated furnaces the men are spelled and work two-thirds of the time.

Hookers, reelers, and conveyor men.—These men are at work only when mill is running and would average from 80 to 85 per cent. The work is not difficult, and relief is obtained by exchanging positions.

Engine-room force.—Constantly on duty, but actual work is light and intermittent.

Millwrights' force.—The only heavy work is during shut down of mills to make adjustments and repairs, say not over 15 per cent of the time. The remainder of time constantly on duty, but usually at light work.

Boiler houses and shops.—Conditions are the same as reported for blast furnaces and steel works.

Estimated percentage of actual working hours for various occupations, American Steel & Wire Co.

BLAST FURNACES.

Occupation.	Hours per turn.	Percentage of time occupied.	Occupation.	Hours per turn.	Percentage of time occupied.
Blower	12	90	Water tender	12	100
Keeper	12	80	Boiler washer	10	80
Helpers	12	80	Flue blower	10	80
Hot blast man	12	90	Fireman	12	80
Clayman	12	80	Ashman	10	80
Water tender	12	90	Foreman pipe fitter	10	100
Cinder snapper	12	85	Pipe fitters	10	100
Stove tender	12	90	Do	12	90
Stove cleaner	10	95	Pipe fitters' helpers	10	100
Skip hoist man	12	90	Do	12	90
Charging car man	12	90	Blowing engineer, first	12	100
Coke dust man	10	90	Blowing engineer, second	12	100
Stock house foreman	12	90	Oilers	12	100
Stock house laborers	12	90	Wipers	10	100
Cager	12	90	Ore bridge operator	12	90
Larry man	12	90	Ore bridge inspector	12	90
Top fillers, No. 1 furnace	8	80	Ore bridge greaser	12	90
Top fillers, No. 2 furnace	12	80	Trestle foreman	12	90
Scrapman	12	90	Trestle laborers	12	90
Flue dust man	12	90	Skuller foreman	10	90
Monkey boss	12	80	Skuller helpers	10	90
Cinder dump foreman	12	90	Millwright	12	90
Cinder dump laborers	12	90	Millwright helpers	12	90
Ladle house men	10	100	Electric powerhouse engineer	12	100
Ladle house crane	12	90	Electric powerhouse oiler	12	100
Casting-machine foreman	12	90	Gas washer operator	12	100
Ladle pourer	12	90	Gas washer operator's helper	12	100
Troughman	12	90	Gas engine blowing room engineers	12	100
Jack operator	12	90	Gas engine blowing room oilers	12	100
Crane operator	12	75	Gas engine blowing room wipers	12	100
Pig sticker	12	80			
Filter-plant operator	12	80			
Pump tender	12	85			

Estimated percentage of actual working hours for various occupations, American Steel & Wire Co.—Continued.

BESSEMER.

Occupation.	Hours per turn.	Percentage of time occupied.	Occupation.	Hours per turn.	Percentage of time occupied.
Blowers	8	100	Mold scrapper	12	90
Blowers	12	90	Hydraulic craneman	12	90
Blowers' assistant	12	100	Ladle liner	12	85
Regulator	8	90	Ladle liner helper	12	85
Vesselman	8	75	Car pusher operator	12	90
Vesselman's helper	8	75	Stripper operator	8	90
Vesselmen repairmen	10	75	Slag crane operator	12	80
Manganese man	12	100	Ladle house crane operator	12	50
Vessel scrapper	12	90	Scrap crane operator	12	50
Bottom makers	12	90	Ladle house labor	12	90
Mixer foreman	12	90	Cinder dock foreman	12	85
Mixer foreman's helper	12	50	Cinder dock laborers	12	85
Mixer crane operator	12	50	Cupola liners	10	100
Cupola foreman	12	90	Cupola liners' helpers	10	100
Do	8	100	Metal unloaders	10	80
Cupola iron tapper	12	90	Blowing engineers	12	90
Do	8	100	Stack cleaner	12	90
Hoistman	8	75	Fan engineer	12	90
Do	12	90	First troughman	12	80
Hoistman's assistant	12	90	Skuller foreman	12	80
Top chargers	12	75	Condenser engineer	12	90
Do	12	90	Pump man	12	90
Stockers	12	75	Purifying man	12	90
Do	8	90	Narrow-gauge engineer	12	90
Coke wheelers	12	90	Narrow-gauge brakeman	12	90
Magnet crane operator	12	75	Bottom-house craneman	12	70
Iron craneman	8	75	Machinist	12	90
Steel pourer	8	90	Do	10	90
Stopper setter	8	90	Water tenders	12	100
Stopper carrier	8	90	Fireman	12	75
Stopper maker	10	100	Ash wheelers	12	75
Mold setter	12	90	Laborers	12	90
Mold capper	12	90	Do	10	100

OPEN HEARTH.

Melter	12	100	Stopper setter	12	80
First helper	12	85	Mold setter	12	60
Second helper	12	85	Platform man	12	75
Pit foreman	12	90	Car pusher	12	75
Slagman	12	80	Stripper operator	12	60
Pitmen	12	80	Iron ladle craneman	12	60
Charging machine men	12	60	Metal mixer	12	75
Pull up	12	80	Metal-mixer helper	12	75
Stockers	12	90	Mixing-house foreman	12	85
Stock cranemen	12	85	Buggy repairman	10	100
Stock cranemen hook on	12	85	Mold-yard craneman	12	85
Foreman stocker	12	90	Mold-yard foreman	10	100
Steel pourers	12	75	Narrow-gauge engineers	12	70
First ladleman	12	95	Narrow-gauge brakeman	12	70
Second ladleman	12	85	Stock weighers	12	90
Ladle crane operator	12	70	Labor foreman	12	90
Furnace water tenders	12	90	Laborers	12	90
Stopper maker	10	100	Do	10	100
Nozzle setter	12	80	Ingot scale weigher	12	90
Nozzle-setter helper	12	80	Millwrights	12	90

Estimated percentage of actual working hours for various occupations, American Steel & Wire Co.—Continued.

BLOOMING MILLS.

Occupation.	Hours per turn.	Percentage of time occupied.	Occupation.	Hours per turn.	Percentage of time occupied.
Roller	8	90	Billet hoist fireman	8	80
Manipulator	8	90	Narrow gauge engineer	12	80
Rougher	8	90	Narrow gauge brakeman	12	80
Tableman	8	90	Scrap crane operator	12	90
Shearman	8	90	Billet dock forman	12	90
Shearman helper	8	90	Billet counter	12	90
Pullover man	12	90	Billet inspector	12	90
Heater	8	100	Labor foreman	12	90
Heater helper	8	100	Steel tracer	12	80
Bottom makers	8	75	Steel recorder	12	90
Pit craneman	8	85	Millwrights and machinists	12	75
Cover boy	8	90	Laborers	12	90
Engineer 2 high	8	90	Do	10	100
Engineer 3 high	12	90	Water tenders	12	100
Engineer's helper	12	90	Fireman	12	75
Conveyor engineer	12	90	Ash wheelers	12	75
Conveyor oiler	12	90	Boiler washers	12	80
Cinderman	12	90	Boiler washer's helpers	12	80
Scrapman	12	90	Gas producer men	12	90
Billet hoist engineer	8	80			

SHOPS.

Machinists	10	100	Slag crusher	10	100
Blacksmiths	10	100	Electric-power engineers	12	100
Carpenters	10	100	Electric-power assistant engineers	12	100
Electricians	10	100	Water tenders	12	100
Pattern shop	10	100	Firemen	12	75
Foundrymen	10	100	Ash wheelers	12	75
Boilermakers	10	100	All yard labor	10	100
Bricklayers	10	100	Railroads	10	100
Reggers	10	100			

NATIONAL TUBE CO.,
Pittsburgh, Pa., February 8, 1912.

Mr. C. L. CLOSE,
United States Steel Corporation, New York, N. Y.

DEAR SIR: Mr. Schiller has referred your two messages of the 7th instant to this office for the necessary attention. The data requested in the first telegram relating to percentage of total employees working regularly 12 hours per day is given below:

Employees working 12 hours per turn 23.31 per cent	4,614
Employees working other than 12 hours per turn 76.69 per cent	15,177
Total 100 per cent	19,791

These figures are based on reports for the month of May, 1911, at which time detailed records were made up, from which we compiled this data, and the number of employees shown represent full turns worked. These data for the latter part of the year have not yet been worked up, and it is impossible to compile same on short notice.

We also give below the data requested in your second telegram, except that where you refer to the "Labor wage" we are giving you the rate paid for common labor:

Department.	Weekly turns— Begin.	Weekly turns— End.	Hours worked.	Common labor rate.	Average daily wage.	
Open hearth:						
Lorain	6 p. m., Sunday	4.10 p. m., Saturday[1]	12	$1.75	$2.95	
Bessemer steel works:						
Lorain	6 p. m., Sunday	4.10 p. m., Saturday [1]	12	1.75	$2.67	
National	6 p. m., Sunday	4.30 p. m., Saturday [1]	12	1.75	3.13	2.80
Riverside	5.45 p. m., Sunday	1 p. m., Saturday	12	1.70	2.62	
Rail mill:						
Lorain	6 p. m., Sunday	4.10 p. m., Saturday[1]	12	1.75	2.78	
Rolling mills:						
Continental	4 a. m., Monday	2 p. m., Saturday	12	1.75	2.88	
Lorain	6 p. m., Sunday	4.10 p. m., Saturday [1]	12	1.75	2.85	
National	6 p. m., Sunday	4.30 p. m., Saturday [1]	12	1.75	2.92	2.93
Riverside	6 p. m., Sunday	3 p. m., Saturday	12	1.70	3.07	
Finishing mills:						
Continental	6.15 a. m., Monday	12.30 p. m., Saturday	10	1.75	2.18	
Lorain	6.30 a. m., Monday	4.10 p. m., Saturday	10	1.75	2.47	
National	6 p. m., Sunday	4.30 p. m., Saturday	10	1.75	2.38	
Pennsylvania	6.15 a. m., Monday	12.30 p. m., Saturday	10	1.75	2.24	2.36
Riverside	6.15 a. m., Monday	11.40 a. m., Saturday	10	1.70	2.18	
Syracuse	7 a. m., Monday	12 m., Saturday	10	1.75	2.56	
Kewanee	7 a. m., Monday	4 p. m , Saturday	10	1.70	2.55	
Standard:						
Hot mills	11 p. m., Sunday	4 p. m., Saturday	10	1.65	2.58	
All other	7 a. m., Monday	4 p. m., Saturday	10	1.65	2.58	
Christy Park	6.45 a. m., Monday	1 p. m., Saturday	10	1.75	2.38	

[1] Men paid up to 6 p. m., but quit work at the time given, subject to mill delays, heats in furnace which have to be rolled, etc.

The data given in respect to turns cover only the operations of the manufacturing units and do not cover the various supporting units, such as power plants, pumping stations, shops, foundries, etc.

We trust you will find this data in satisfactory shape, and remain,

Yours, very truly,

B. C. MOISE, *Auditor*,
Per C. B. FOSTER.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

WM. B. SCHILLER,
President National Tube Co., Frick Building, Pittsburgh, Pa.:

Will you please send me to-day, if possible, the time of day for starting and stopping weekly turns, separately, in the following departments; open hearth, Bessemer, rolling mill, and finishing mills. Would also like number of hours constituting day's work, the labor wage, and the average daily wage for these departments.

C. L. CLOSE.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

WM. B. SCHILLER,
President National Tube Co., Frick Building, Pittsburgh, Pa.:

Will you please give me percentage of total employees in your company working regularly 12 hours per day?

C. L. CLOSE.

[Telegram.]

UNITED STATES STEEL CORPORATION,
Pittsburgh, Pa., February 8, 1912.

C. L. CLOSE:

Answering your two telegrams of yesterday to Mr. Schiller. Data requested is being forwarded to-day by mail.

B. C. MOISE.

NATIONAL TUBE CO.,
Pittsburgh, Pa., December 8, 1911.

DEAR MR. CLOSE: In response to your letter of the 7th instant, I think you have misunderstood Mr. Ewing's correspondence. The 6-day week plan was put into effect at all of our works on August 1 last. The plan employed was the printed plan sent out by the Amrican Iron & Steel Institute, except that the extra relief men are kept in fixed positions and the other members of the groups are moved up to the positions next above their regular ones on the rest days of the men immediately above them, a study of the subject having satisfied us that this modification worked out rather better than to change the relief men from one position to another and that it helped in some measure to overcome the objections of the men formerly working 7 days against the loss of one day's compensation, because for a part of the time they work each week they receive a higher compensation than is paid them when they work in their regular positions; and, further, because the plan as modified tended to increase the average efficiency of the whole force, because it familiarized the majority of the men with the duties of the positions next above their regular ones. In cases of emergencies, if men are called out and work a full turn, they are laid off one day before the next seven days have expired, so that in every case each man gets a day's rest once in seven days.

As to the extent the hours of labor have been reduced, I don't know that I quite comprehend what you want. In all continuous employment, where the men formerly worked seven days and worked a long turn of either 18 or 24 hours, they now work six turns only of the number of hours that constitute the regular day's work and do not in any case work more than that. In other words, the 12-hour men work 6 days of 12 hours each and the 10-hour men 6 days of 10 hours each.

When the plan was sent out originally to the works' managers, they were advised they could make such modification of it as suited their local conditions, provided it accomplished the two results desired, namely, the abolishment of the 7-day week and the long turn, but after several conferences on the subject it was deemed best for all to follow the same plan, and this has been done, and, as stated previously, the plan has been in effect at all of our works since the 1st of last August.

Yours, very truly,

WM. B. SCHILLER, *President.*

Mr. C. L. CLOSE
(Care of United States Steel Corporation),
New York, N. Y.

NATIONAL TUBE CO.,
Pittsburgh, Pa., October 17, 1911.

DEAR SIR: Replying to your communication of the 13th instant, I beg to advise that the 6-day-week plan was put into effect at all of the works of this company on August 1 last. The method by which this was accomplished was virually the printed plan sent out under the auspices of your institute, except that the extra relief men were kept in the lower positions of each group constantly and the other members of the group were moved up to the positions next above their regular ones on the rest days of the men immediately above them.

To give you a better idea of the actual method I inclose a plan showing how this was accomplished. This plan, you will observe, groups six different positions which under the old system involved the employment of 12 men, 6 on each turn. All these 12 men work on Sunday, their rest periods being on the different week days and the relief men have their rest period on Sunday. It was found that this modification worked out rather better than to change the relief men from one position to another, and in adition it helped to overcome the objections of the men against the loss of one day's compensation. The results seen and hoped for are as follows:

(1) It was the right thing to do and therefore should be done, it being our opinion that no man should be compelled or permitted to work 7 days each week, and either 18 or 24 hours consecutively every two weeks in changing from day to night or night to day.

(2) It is believed that the plan will in time increase the average efficiency of the whole force affected, because it familiarizes 10 out of the 14 men with the duties of the positions next above their regular ones.

(3) It is believed that the adoption of this plan will in time enable us to secure men of higher average intelligence in our blast-furnace departments. There has been a marked decrease in the intelligence of these employees during the past 12 or 15 years, largely, we believe, because intelligent men did not wish to work 7 days every week, and therefore sought employment in other departments.

The inauguration of the plan necessitated some little increase in the force of time-keepers at our larger works, but the additional expense is comparatively insignificant. It is believed by our works managers that in a few months' time the men will be entirely reconciled, if they are not now, and would not willingly go back to the old plan. It is also believed by our works managers that the regular crews whose rest periods come on week days, and the same day each week throughout the year, will after a time prefer to have their rest day come on a week day rather than on Sunday, because of the greater opportunity for entertainment and amusement.

If any of the members of the institute would like to have additional information I shall be pleased to answer any of their communications, or if they desire I would be glad to extend permission to them or their representatives to visit our works and make a personal study of the operations of the plan.

Yours, very truly,

WM. B. SCHILLER, *President.*

Mr. JAS. T. MCCLEARY,
Secretary American Iron & Steel Institute,
50 Church Street, New York, N. Y.

AMERICAN IRON & STEEL INSTITUTE,
HUDSON TERMINAL BUILDING, 30 CHURCH STREET,
New York, December 6, 1911.

MY DEAR MR. CLOSE: Referring further to our telephone conversation of this morning in connection with the 6-day-week plan. For your information I inclose copy of a letter from Mr. William B. Schiller, president of the National Tube Co., Pittsburgh, which gives an idea of the situation as relating to their particular operations.

Trusting this information will aid you in assembling your data, I am,

Very truly, yours,

THOMAS DARLINGTON,
Secretary of the Welfare Committee.

Mr. C. L. CLOSE,
(Care of United States Steel Corporation),
71 Broadway, New York City.

NATIONAL TUBE CO.,
Pittsburgh, Pa., October 16, 1911.

DEAR SIR: Immediately on receipt of your letter of August 31, asking for the average hours of rest and active labor for the different classes of our employees, we set about collecting this information and it reached me in tabluated form October 5, but I found that it was not in proper shape and that the information had evidently been compiled hastily and was not very reliable. Inasmuch as I felt you wanted this information without much delay I started to have the periods of rest taken at a number of the typical positions at our National and Lorain Works. This is correct and reliable, as shown on the inclosed statement, which gives the number of hours constituting the standard day for each of the positions, the idle time in hours and minutes, the working time in hours and minutes, and the percentage this actual working time is of the total hours constituting the turn, which I trust is in the shape you desire it.

Yours, very truly,

WM. B. SCHILLER, *President.*

Mr. J. A. FARRELL,
President United States Steel Corporation, New York, N. Y.

Period of rest from actual work of men in principal occupations working 8, 10, and 12 hour turns, National Tube Co.

Occupations.	National.				Lorain.				Remarks.
	Hours constituting standard day.	Idle time.	Working time.		Hours constituting standard day.	Idle time.	Working time.		
		h. m.	h. m.	Per cent.		h. m.	h. m.	Per cent.	
Blast furnaces:									
Product weighers	12	7 ..	5 ..	41.67	12	4 12	7 48	65.00	Blast furnace; average working time, 74.79.
Bottom fillers and barrow men	12	2 14	9 46	81.39	.....	.. ..	.. ..	.....	
Coke unloaders	12	2 30	9 30	79.17	12	1 7	10 53	90.70	
Skip oilers	12	2 40	9 20	77.78	11	3 23	7 37	69.24	
Hot-blast men	12	2 30	9 30	79.17	12	1 ..	11 ..	91.67	
Stove cleaners	12	3 10	8 50	73.61	12	1 6	10 54	90.83	
Keepers	12	3 25	8 35	71.53	12	3 2	8 58	74.72	
Ladle men	12	3 30	8 30	70.83	12	4 35	7 25	61.81	
Cinder snappers	12	3 30	8 30	70.83	12	3 9	8 51	73.75	
				71.77				77.21	
Converting works:									
Mixer men	12	1 36	10 24	86.67	12	4 26	7 34	63.06	Converting works; average working time, 66.56.
First regulator	12	.. 51	11 9	92.92	12	2 23	9 37	80.14	
Vessel scrapper	12	5 42	6 18	52.50	12	5 36	6 24	53.33	
Vessel men	8	4 23	3 37	45.21	12	7 23	4 37	38.47	
Bottom makers	12	2 30	9 30	79.17	12	2 43	9 17	77.36	
Steel porers	8	1 27	6 33	81.88	12	5 6	6 54	57.50	
Stripper men	12	4 ..	8 ..	66.67	12	4 15	7 45	64.58	
Ladle liners	12	2 50	9 10	76.39	12	3 30	8 30	70.83	
Stopper makers	10	2 ..	8 ..	80.00	12	3 10	8 50	73.61	
Narrow-gauge engineers	12	2 40	9 20	77.78	12	5 36	6 24	53.33	
				69.91				63.22	
Blooming mills:									
Pit cranemen	12	4 53	7 7	59.30	12	3 29	8 31	70.97	Blooming mills; average working time, 73.87.
Bottom makers	12	8 43	3 17	27.36	12	4 32	7 28	62.22	
Rollers	12	1 57	10 3	83.75	12	3 24	8 36	71.67	
Roughers	12	4 50	7 10	59.72	12	4 40	7 20	61.11	
Shearmen	12	2 6	9 54	82.50	12	4 29	7 31	62.64	
Conveyer men	12	2 6	9 54	82.50	12	4 52	7 8	59.44	
Cranemen	12	2 6	9 54	82.50	12	4 40	7 20	61.11	
Scale wheelers	12	1 32	10 28	87.22	10	3 12	6 48	68.00	
				70.60				77.14	

Period of rest from actual work of men in principal occupations working 8, 10, and 12 hour turns, National Tube Co.—Continued.

Occupations.	National.				Lorain.				Remarks.
	Hours constituting standard day.	Idle time.	Working time.		Hours constituting standard day.	Idle time.	Working time.		
		16-inch continuous.				*14-inch continuous.*			
		h. m.	h. m.	Per cent.		h. m.	h. m.	Per cent.	
Skelp mills:									
Stock-unloading cranemen	12	6 35	5 25	45.14	.....	.. ..	.. ..	.....	
Stockers	.....	.. ..	.. ..	.....	12	3 ..	9 ..	75.00	
Heaters' helpers	12	2 10	9 50	81.94	12	.. 30	11 30	95.84	
Furnace lever men	12	2 25	9 35	79.86	12	3 ..	9 ..	75.00	
Rougher	12	1 ..	11 ..	91.67	12	3 ..	9 ..	75.00	
Transfer men	.....	.. ..	.. ..	.....	12	3 ..	9 ..	75.00	
Shearmen	12	1 ..	11 ..	91.67	12	3 ..	9 ..	75.00	
Skelp pilers	12	1 45	10 15	85.42	.....	.. ..	.. ..	.....	
		13-inch Belgian.				*13-inch continuous.*			
Stock-unloading cranemen	12	3 15	8 45	72.92	.....	.. ..	.. ..	.....	
Stockers	.....	.. ..	.. ..	.....	12	2 45	9 15	77.08	
Heaters' helpers	12	1 5	10 55	90.97	.....	.. ..	.. ..	.....	
Furnace lever men	12	1 10	10 50	90.28	12	2 35	9 25	78.47	
Roughers	12	.. 30	11 30	95.84	.....	.. ..	.. ..	.....	
Finishers	.....	.. ..	.. ..	.....	12	.. 56	11 4	92.22	
Transfer men	12	1 30	10 30	87.50	12	2 55	9 5	75.70	
Shearmen	12	1 30	10 30	87.50	12	3 26	8 34	71.40	
		110-inch plate.				*90-inch plate.*			Skelp mills; average working time, 84.18.
Chargers	12	7 ..	5 ..	41.67	12	1 33	10 27	87.08	
Slab-car operators	12	1 30	10 30	87.50	12	3 26	8 34	71.40	
Greasers	12	1 30	10 30	87.50	12	1 20	10 40	88.90	
Table men	12	1 45	10 15	85.42	12	1 15	10 45	89.58	
Screw down	12	1 30	10 30	87.50	12	.. 44	11 16	93.90	
Rotary shearmen	12	1 10	10 50	90.28	12	1 5	10 55	90.97	
		42-inch universal.				*48-inch universal.*			
Chargers	12	7 ..	5 ..	41.67	12	3 23	8 37	71.81	
Slab-car operators	12	1 30	10 30	87.50	12	2 40	9 20	77.78	
Table men	12	1 ..	11 ..	91.67	.....	.. ..	.. ..	.....	
Screw down	12	1 ..	11 ..	91.67	12	2 23	9 37	80.14	
Shearmen	12	1 ..	11 ..	91.67	12	2 31	9 29	79.03	
Transfer men	.....	.. ..	.. ..	.....	12	2 23	9 37	80.14	

							28-inch reversing.					
Chargers	.....	..	..	..	..	.....	12	1	40	10	20	86.11
Slab-car operators	.....	..	..	..	..	.....	12	1	40	10	20	86.11
Shearmen	.....	..	..	..	..	.....	12	1	40	10	20	86.11
Transfer men	.....	..	..	..	..	.....	12	1	40	10	20	86.11
						86.80						81.57
Butt-welding furnaces:												
Chargers	10	3	20	6	40	66.67	10	4	2	5	58	59.67
Pickers	10	5	..	5	..	50.00	10	5	..	5	..	50.00
Welders	10	5	40	4	20	43.34	10	5	57	4	3	40.50
Hook runners	10	4	..	6	..	60.00	10	4	39	5	21	53.50
Size rollers	10	5	..	5	..	50.00	10	2	..	8	..	80.00
Lap welding:												
Chargers	10	3	20	6	40	66.67	10	4	56	5	4	50.67
Benders	10	2	15	7	45	77.50	10	6	41	3	19	33.17
Tong runners	10	2	42	7	18	73.00	10	4	27	5	33	55.50
Welders	10	1	..	9	..	90.00	10	..	50	9	10	91.67
Turners down	10	3	32	6	28	64.67	10	6	5	3	55	39.18
Pit hands	10	2	10	7	50	78.33	10	4	6	5	54	59.00
Ballers	10	1	38	8	22	83.67	10	3	37	6	23	63.83
Bar pullers	10	1	38	8	22	83.67	10	3	12	6	48	68.00
Cross rollers	10	1	..	9	..	90.00	10	3	..	7	..	70.00
Sticker dressers	10	2	..	8	..	80.00	10	2	7	7	53	78.83
Butt mill finishing:												
Threaders	10	1	..	9	..	90.00	10	..	54	9	6	91.00
Testers	10	1	..	9	..	90.00	10	1	5	8	55	89.17
Inspectors	10	1	..	9	..	90.00	10	1	45	8	15	82.50
Bundlers	10	1	..	9	..	90.00	10	..	51	9	9	91.50
Lap mill finishing:												
Threaders	10	1	..	9	..	90.00	10	..	19	9	41	96.83
Testers	10	1	..	9	..	90.00	10	2	26	7	34	75.67
Stenciliers	10	1	..	9	..	90.00	10	2	34	7	26	74.33
Inspectors	10	1	..	9	..	90.00	10	1	45	8	15	82.50
						81.03						68.56
Socket bending:												
Benders (power)	10	2	..	8	..	80.00	10	2	52	7	8	71.33
Benders (Blakey)	10	..	45	9	15	92.50	10	..	19	9	41	96.83
Heaters (power)	10	2	..	8	..	80.00	10	2	52	7	8	71.33
Socket welding:												
Roller welders	10	3	20	6	40	66.67	10	5	45	4	15	42.50
Extractors	10	3	20	6	40	66.67	10	2	41	7	19	73.17
Heaters (steam)	10	2	30	7	30	75.00	10	6	30	3	30	35.00
Heaters (Bradley)	10	2	30	7	30	75.00	10	1	21	8	39	86.50
Welders (steam)	10	2	30	7	30	75.00	10	6	30	3	30	35.00
Welders (Bradley)	10	2	30	7	30	75.00	10	1	31	8	29	84.83

Finishing mills; average working time, 75.09. Total average for blast furnace, converting works, blooming mills, skelp mills, and finishing mills, 74.89.

Period of rest from actual work of men in principal occupations working 8, 10, and 12 hour turns, National Tube Co.—Continued.

Occupations.	National.				Lorain.				Remarks.
	Hours constituting standard day.	Idle time.	Working time.		Hours constituting standard day.	Idle time.	Working time.		
		42-inch universal.				*38-inch reversing.*			
		h. m.	h. m.	*Per cent.*		h. m.	h. m.	*Per cent.*	
Socket finishing:									
Tappers	10	.. 30	9 30	95.00	10	.. 56	9 4	90.67	
Countersinkers	10	.. 30	9 30	95.00	10	.. 45	9 15	92.50	
Recessers	10	.. 30	9 30	95.00	10	.. 25	9 35	95.83	
Facers	10	.. 30	9 30	95.00	.....	.. ..	.. ..	.....	
Sizers	10	.. 30	9 30	95.00	10	2 23	8 37	76.17	
Gaugers	10	.. 15	9 45	97.50	10	.. 24	9 36	96.00	
Washers	10	.. 30	9 30	95.00	10	1 8	8 52	88.67	
Galvanizing plant:									
Pickler	10	1 30	8 30	85.00	10	2 8	7 52	78.67	
Magnet operators	10	1 ..	9 ..	90.00	10	1 19	8 41	86.83	
Pot chargers	10	2 30	7 30	75.00	10	.. 38	9 22	93.67	
Galvanizers	10	1 ..	9 ..	90.00	10	.. 31	9 29	94.83	
Skimbacks	10	1 30	8 30	85.00	10	1 28	8 32	85.33	
Truckers	10	1 ..	9 ..	90.00	.....	.. ..	.. ..	.....	
Pipe straighteners	10	2 ..	8 ..	80.00	10	1 6	8 54	89.00	
Cranemen	12	1 48	10 12	85.00	12	2 37	9 23	78.20	
Iron foundry:									
Molders	10	1 ..	9 ..	90.00	10	1 18	8 42	87.00	
Core makers	10	.. 30	9 30	95.00	10	.. 12	9 48	98.00	
Cupola men	10	.. 30	9 30	95.00	10	1 30	8 30	85.00	
Chippers	.....	.. ..	.. ..	.....	10	.. 21	9 39	96.50	
Cranemen	10	1 ..	9 ..	90.00	11½	2 54	8 36	74.78	

ILLINOIS STEEL CO., COMMERCIAL NATIONAL BANK BUILDING,
Chicago, February 8, 1912.

Mr. C. L. CLOSE
(Care of United States Steel Corporation),
Empire Building, New York City.

DEAR SIR: Answering your "wire No. 448 of even date."

South works—Schedule for starting and stopping weekly turns,

Open hearth, starts 6 p. m. Sunday, stops 6 p. m. Saturday.
Bessemer department, starts 3 a. m. Monday, stops 3 a. m. Sunday.
Rolling mills and finishing departments ,start 6 a. m. Monday, stop 6 a. m. Sunday.
Common labor wage, 17 cents per hour.
Average daily wage:

Open hearth No. 2	$3.06
Rail mill No. 1	2.87
Rail mill No. 2	2.55
Plate mill No. 1	2.84
Plate mill No. 2	2.57
Structural mill	2.65

Twelve hours constitute a day's work, except for mechanical men, who work 10 hours, and tonnage men in Bessemer and rail departments, who work 8 hours.

Gary works—Schedule for starting and stopping weekly turns.

Open hearths, start 6 p. m. Sunday, stop 6 p. m. Saturday.
Rolling mills and finishing departments, start 6 a. m. Monday, stop 6 a. m. Sunday.
Common labor wage, 17 cents per hour.
Average daily wage:

Open hearth No. 2	$2.94
Open hearth No. 4	3.06
Rail mill No. 1	2.78
Billet mill	2.65

Twelve hours constitute a day's work, except for mechanical men, who work 10 hours.

Yours, truly, E. J. BUFFINGTON, *President.*

[Telegram.]

UNITED STATES STEEL CORPORATION,
Chicago, February 7, 1912.

C. L. CLOSE:

No modification or changes to be made in my statement. Letter October 4 to Mr. Bolling concerning 6-day labor, except Gary works, has made additional progress, and all works report slight deviation from plan account extraordinary weather conditions. This deviation not permanent, however. Will wire you percentages requested later. Data now being obtained therefor.

R. W. CAMPBELL.

[Telegram.]

UNITED STATES STEEL CORPORATION,
Chicago, February 7, 1912.

C. L. CLOSE:

Your telegram—Will mail reply to-morrow Twentieth Century Special delivery. Statement is lengthy, but can telegraph to-morrow if necessary. Please advise.

E. J. BUFFINGTON.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

R. W. CAMPBELL,
(Knapp & Campbell),
Commercial National Bank Building, Chicago, Ill.:

Do you have any modification or changes to make in your statement, letter October 4, to Mr. Bolling, concerning 6-day labor. Would also like to know percentage of total men employed working regularly 12 hours per day.

C. L. CLOSE.

[Telegram.]

UNITED STATES STEEL CORPORATION,
February 7, 1912.

E. J. BUFFINGTON,
President Illinois Steel Co.,
Commercial National Bank Building, Chicago, Ill.:

Will you please send me to-day, if possible, the time of day for starting and stopping weekly turns, separately, in the following departments: Open hearths, rolling mill, and finishing mill, for both Cary and South Works. Would also like number of hours constituting day's work, the labor wage and the average daily wage for these departments.

C. L. CLOSE.

KNAPP & CAMPBELL, COMMERCIAL NATIONAL BANK BUILDING,
Chicago, October 4, 1911.

Mr. RAYNAL C. BOLLING,
Empire Building, New York City.

DEAR SIR: On receipt of your request under date of September 23, for information concerning the manner and extent of the installation of the 6-day week in the plants of the Illinois Steel Co., I took the matter up with Mr. Buffington and have been advised by him that the 6-day week has been put into effect in all of our plants to a somewhat greater extent in some than in others.

At Joliet, prior to the introduction of the plan during the past summer, 46 per cent of the men enrolled were working 7 days per week. Now there are less than five-tenths of 1 per cent of the men enrolled working 7 days continuously. This small percentage of men working 7 days continuously comprises a very few men in the machine shop and yard under emergency conditions.

At South Works 4 per cent of the men enrolled are working 7 days continuously and it is reported that a material reduction will be made in this percentage by the South Works management.

At Milwaukee Works the plan is in force throughout the plant, and there are no men working longer than 6 days continuously.

At Gary Works not quite so much progress has been made, but the plan is still being furthered and as fast as possible will be put into full effect. You will recall that conditions at Gary Works are different from those surrounding the older organizations at South, Joliet, and Milwaukee, and that it is hardly possible to make as much progress in a new departure such as this there as at our other works.

The plan has not been coupled with any material limitation upon the daily hours of labor, except that at the change of week turns in some of the departments some men work more than 12 hours, but such men are given a compensating longer rest period thereafter.

All of the superintendents report complaints from certain classes of employees on account of the lessened amount of the weekly wage received.

I trust this gives you the information which you desire, but if there is any further information or data which you wish, kindly let me know and I will be very glad to obtain it for you.

Yours, very truly,

R. W. CAMPBELL.

ILLINOIS STEEL CO., COMMERCIAL NATIONAL BANK BUILDING,
Chicago, August 8, 1911.

Mr. J. A. FARRELL,
President United States Steel Corporation, New York City.

DEAR SIR: Replying to your inquiry dated August 5, the labor enrollment of the several subsidiary companies of the United States Steel Corporation in the Chicago district is as follows:

	Employees.
Illinois Steel Co. (including Gary Works)	18,000
American Steel & Wire Co	4,600
Elgin, Joliet & Eastern Railroad Co	3,841
American Sheet & Tin Plate Co	[1] 1,500
American Bridge Co	[1] 1,200

None of these subsidiary companies excepting the Illinois Steel Co. has statistics showing various nationalities under labor enrollments. Of the Illinois Steel Co.'s labor enrollment approximately 75 per cent are registered as of various nationalities, and approximately 25 per cent are recorded as non-English speaking. The attached tabulation shows the number of each of the various nationalities represented in the Illinois Steel Co.'s enrollment. While similar statistics of the other subsidiary companies represented in this district are not available, it may be assumed that none of them has so large a percentage of foreign nationalities represented in their labor enrollment.

The locations of the manufacturing plants of these several subsidiary companies in the Chicago district are as follows:

Illinois Steel Co.—Three plants in the city of Chicago, 1 plant at South Milwaukee, Wis.; 1 plant at Joliet, Ill.; 1 plant at Gary, Ind.

American Steel & Wire Co.—Two plants at Joliet, Ill.; 1 plant at Waukegan, Ill.; 1 plant at De Kalb, Ill.; 1 plant at Anderson, Ind.

American Bridge Co.—One plant at Gary, Ind.

American Sheet & Tin Plate Co.—One plant at Gary, Ind.

None of the companies at any of these plants, excepting those located at Gary, Ind., undertakes to furnish housing facilities for employees; each company at all manufacturing plants, excepting at Gary, Ind., relying wholly upon the housing facilities generally available in the communities where the respective manufacturing plants are located. The quality of such housing facilities naturally varies in the various communities.

The housing facilities in South Chicago adjacent to the South Works plant of the Illinois Steel Co. are generally poor, especially the housing facilities used by the foreign labor. The Illinois Steel Co. of course exercises no control over these facilities and can not exercise any such control by reason of the diversified ownership of such housing facilities. The same is true concerning the housing facilities surrounding the other two plants of the Illinois Steel Co. in the city of Chicago.

At Joliet, Ill., the housing facilities are somewhat better than in Chicago.

These facilities at Waukegan and De Kalb, Ill,, and Anderson, Ind., on the whole are considerably better than the housing facilities at either Chicago or Joliet, Ill.

At Gary, Ind., the Gary Land Co., a subsidiary of the United States Steel Corporation, has built and rents to the employees of the Gary Works approximately 500 dwelling houses, the aggregate cost of which was approximately $1,125,000. These dwelling houses are of good construction, each containing all modern facilities, such as water, gas, electricity, and proper sewer connections. The rental value of these houses ranges from $10 per month to approximately $30 per month. Nearly all of these dwellings are now occupied.

The Gary Land Co. has under construction 200 dwelling houses intended for the use of the employees of the American Sheet & Tin Plate Co., and also 294 dwelling houses intended for the use of the employees of the American Bridge Co., at the Gary, Ind., plants of these two companies. All of these houses are located in what is known as the Gary Land Co.'s first subdivision, in which the land company originally owned all of the lots.

Within this first subdivision the land company graded and paved with macadam or concrete blocks approximately 22 miles of streets, laid sidewalks, installed modern gas, water, and electric light plants, and a complete system of sewers. Each lot in the subdivision is connected with these improvements and utilities.

[1] Estimated labor enrollment of these two companies after their respective plants at Gary, Ind., are in full operation.

It was necessary for the company to build, at its own expense, a large number of houses to meet the first needs of the employees. Lots are offered for sale on terms of easy payment, at approximately the cost of the land and the improvements, under requirement that the purchaser shall build a house of approved design and character within 18 months after purchase. Employees of the steel company are offered special discount from the list price of lots. The land company offers for sale also to employees of the subsidiary companies dwelling houses at approximately cost value, on terms of easy payment, with liberal protection to the purchaser in case of his leaving the employ of subsidiary company, either voluntarily or involuntarily. Quite a number of employees have availed of this opportunity to purchase lots or dwelling houses.

Nowhere, excepting at Joliet, Ill., do the companies attempt to do directly any community or social-betterment work, the idea being that more efficient work and work more acceptable to the employees can be done by cooperating with community activities for betterment work.

For the reason that Gary, Ind., is an industrial community of recent development more of this cooperative community work is attempted by the subsidiary companies there than perhaps at other places where these companies operate plants.

Churches of all denominations represented in Gary have received substantial aid from our companies. The land company has furnished free a site for a hospital to be administered by the Sisters of Mercy, an organization associated with the Catholic Church. Prior to the erection of a permanent hospital building the Sisters of Mercy have administered hospital services to the community, using temporary buildings provided by the land company.

One of the most promising community activities for social betterment in Gary centers around the Young Men's Christian Association, for which Mr. Elbert H. Gary has provided a large building of fireproof construction throughout, containing a dormitory of 67 rooms, library, educational department, athletic department equipped with swimming pool and modern gymnasium, and a general assembly room. Our several companies have contributed liberally to the furnishing of this building and will contribute to its administration. Employees of all companies represented at Gary are encouraged to take active interest in this association.

Athletics, consisting principally of baseball, are encouraged at practically all of the plants, and at some of these plants well-equipped baseball grounds, located near the manufacturing plants, are provided for the employees.

At all of the plants of the several companies careful attention is given to plant sanitation and safety, provision for this being administered by specially organized departments therefor. Large sums of money are spent to minimize risk of injuries to employees and to provide best plant sanitation.

At Joliet, Ill., in addition to cooperating with community activities along the line of social betterment, the Illinois Steel Co. has built a club house at a cost of approximately $60,000, containing a gymnasium, library, rooms for educational work, such as mechanical drawing, domestic science, etc., and a large assembly room used for lecture courses, musicales, etc. This club is under the supervision of a paid representative of the Illinois Steel Co., but is managed by a board of directors made up of selected employees of the different subsidiary companies having plants at Joliet. The families of employees of all subsidiary companies are eligible to membership in this club. The membership dues are $1 per year, the membership entitling members to all of the privileges of the club without any additional cost. The purpose of this membership charge is evident, namely, to encourage a feeling of independence of members.

It is difficult to recognize or find beneficial results from these activities upon the foreigners in our employ, but undoubtedly there is an ultimate influence for good.

The foreign labor available at the company's mills is of a more or less migratory character, apparently undergoing constant changes. Generally speaking, this foreign labor is engaged in what is termed common labor, where no particular skill is required. Ultimately a certain percentage of this "floating labor" becomes more efficient and contributes to our supply of skilled labor and becomes a part of our permanent labor enrollment.

A prevailing opinion, which seems well founded, is that the public schools in industrial communities exercise a larger influence upon the social conditions of the foreigners through their children than any other activity. True, only a small percentage of the foreign labor employed at our mills represent any family life, by far the greater part of these foreigners coming from their native homes without families. But undoubtedly many of them come with families of children, and through the influence of the public schools upon these children a good influence is exerted upon the parents.

Yours, very truly,

E. J. BUFFINGTON, *President.*

Statistics from nationality report Illinois Steel Co. accounting department, 1911.

Country.	Total of each nationality.	English speaking.	Non-English speaking.
United States (26+ per cent)	4,621	4,621	.....
German Empire	1,292	1,156	136
England	1,030	1,030	.....
Austria-Hungary	4,622	2,895	1,727
Italy	347	210	137
Norway	139	137	2
Sweden	654	624	30
Russian Empire	2,580	1,046	1,534
Denmark	17	17	.....
Servia	1,249	578	671
France	13	12	1
Belgium	4	4	.....
Mexico	1	1	.....
Bulgaria	149	78	71
Roumania	554	253	301
Japan	7	7	.....
Australia	1	1	.....
Switzerland	9	9	.....
Turkey	56	12	44
Persia	12	12	.....
Greece	63	24	39
Spain	8	5	3
Montenegro	3	3	.....
Total	17,431	12,735	4,696

AUGUST 7, 1911.

Mr. T. W. ROBINSON, *First Vice President.*

DEAR SIR: Referring to our experience with the coffee house at South Chicago:

The building was completed and put in commission in March, 1906. The upper story was used as an office by the Chicago, Lake Shore & Eastern Railroad Co., while the lower floor was fitted up for the purpose of dispensing hot coffee to such employees as cared to take advantage of a comfortable room in which to eat their lunch. A part of this floor was arranged with small booths similar to the booths in accounting rooms, so that each man enjoyed as much privacy as he wished while eating his food. Fixed stools, such as are found at lunch counters, were suitably arranged in front of these booths. In another portion of the building was a water-closet, wash rooms, toilet for women and children, and benches upon which the women and children could rest. In one corner of the room was a counter upon which was arranged a coffee urn, and from which coffee was dispensed at the nominal sum of 1 cent per cup. This, of course, did not pay the cost of making the coffee, and fell far short of contributing toward the cost of running the establishment. A record was kept of the attendance, and while I have not the figures at hand, my recollection is that not more than an average of nine men a day took advantage of the conveniences.

I took the matter up with the priests of different parishes, who called the attention of their congregations to the coffee house and also published in their church periodicals notices that such conveniences were furnished by the company. Every means was exhausted to bring the matter before the attention of the employees. At a conference with the priests, held in my office some months after starting the venture, they informed me that upon inquiry a number of men refused to come because they thought the company had ulterior motives in handing out such kindness. Others stated that on account of the short term at noon—namely, one-half hour—it was impossible for them to get from and back to their work on time. I am inclined to believe that the former was the principal reason, because the men continued to sit out on the sidewalks during the summer months and to visit the saloons in the winter time.

I am not sure of the exact date on which we discontinued the coffee house, but it is my recollection that in the late spring or early summer of 1907 we decided that, the attendance not having increased, much better use could be made of the building for office purposes than along the lines for which it was proposed.

I think this, in a general way, covers the history of the venture.

Yours, truly,

W. A. FIELD, *General Superintendent.*

SOUTH WORKS.

Departments.	Hours per turn.	Duration of rest periods.	Frequency of rest periods.
Blast furnaces:			
Cast-house men	12	About 1 hour	Between cleaning up one cast and starting next.
Stock-house men	12	Irregular	Occasionally according to rate of driving furnace.
Cinder-crane men	12	do	Between cleaning up one flush of cinder and next.
Unloaders	12	do	Between switches by railroads.
Ladle skullers	12	do	Between trips.
Other labor	12	do	Labor not exhausting; practically no rest periods, but have idle periods when furnace slows up for any reason.
Rail mill No. 1:			
Bloom levermen	8	½ hour	Two men take turn about each half hour.
Bloom-shear levermen			
First roughing levermen			
Second roughing levermen			
Finishing levermen			
Hot-saw levermen	12	do	Do.
Ingot-buggy operator	8	1 hour	Rests each third hour.
Rail mill No. 2:			
Roughing levermen	12	About ⅓ of time	One spell hand on four jobs.
Intermediate levermen			
Finishing levermen			
Hot-saw levermen			
Butt pullers on hot saw	12	About ¼ of time	Four men on these jobs.
Rail pullers			
Hot and cold dog operators	12	½ time	Spelled by laborer for hotbed.
Slabbing mill, cranemen	12	Average 2½ hours	One spell hand on four jobs.
Converting works		Irregular	Men allowed regularly half hour at noon, and in addition spell each other when necessary.
Plate mill No. 1		do	Charging machine men spell roll hands when not charging furnaces or drawing material.
Plate mill No. 2		do	Levermen and roll hands are spelled at various times by "utility man."
Foundry	12	do	Roll cranemen spell other cranemen.
Structural mill		do	Cranemen spell as required.

NOTE.—Nearly all the occupations in the rolling mill are such that the men are not constantly employed, but have more or less time for a spell during the turn, due to rolling conditions.

JOLIET WORKS.

Blast furnaces:			
Cast-house men	12		Work about ¾ time; rest about ¼.
Stock-house men	12		Work about ⅔ time; rest about ⅓.
Top fillers	12		Work about ⅔ time; rest about ⅓.
Billet mill:			
Bloom mill levermen	8	15 minutes	Every 15 minutes.
Bloom shear levermen			
Billet shear levermen			
Roughing levermen	12	20 minutes	Every 40 minutes.
Finishing levermen			
Bloom butt conveyormen			
Billet butt catcher			
Ingot buggy operators	12	30 minutes	Every hour.
Continuous rod mill, shear stop men.	12	do	Every 30 minutes.
No. 1 rod mill:			
Reelers and oilers	12	do	Do.
Drag conveyormen	12	do	Do.
Bundle conveyor (take off)	12	do	Every hour.
12-inch roll hands	8	do	Every 30 minutes.
First pass roll hands	8	do	Do.
Second pass roll hands	8	do	Do.
Third pass roll hands	8	do	Do.
Fourth pass roll hands	8	do	Do.
No. 2 rod mill:			
Reelers and oilers	12	do	Do.
Drag conveyormen	12	do	Do.
Bundle conveyors (take off)	12	do	Every hour.
14-inch pass roll hands	8	do	Every 30 minutes.
First pass roll hands	8	do	Do.
Second pass roll hands	8	do	Do.
Third pass roll hands	8	do	Do.
Fourth pass roll hands	8	do	Do.

JOLIET WORKS—Continued.

Departments.	Hours per turn.	Duration of rest periods.	Frequency of rest periods.
Morgan mill:			
Stop men (laborers)	12	do	Every hour.
Merchant mill:			
Roughers and hookers	12	15 minutes	Every 15 minutes.
Finishers, Stranders, Catchers, Straighteners	12	20 minutes	Every 40 minutes.
Spike factory:			
Forging-machine operators	12	8 minutes	Every 52 minutes.
Forging-machine feeders	12	20 minutes	Every 40 minutes.
Forging-machine chargers	12	do	Do.
Conveyor boys	12	12 minutes	Every 48 minutes.
Splice mill:			
Furnace chargers	12	20 minutes	Every 40 minutes.
Pull-out at furnace	12	do	Do.
Bending press operators	12	15 minutes	Every 45 minutes.

MILWAUKEE WORKS.

Blast furnaces, all regular men	12	Irregular	Have about 1½ hours spare time during their shifts.
Merchant mills:			
Roughers, Finishers, Pass boys	12	30 minutes	Every 30 minutes.
Stranders	12	20 minutes	Every 40 minutes.
Roughers	8	30 minutes	Every 30 minutes.
Do	8	20 minutes	Every 40 minutes.
Stranders	8	do	Do.

ILLINOIS STEEL CO.,
Chicago, September 29, 1911.

MR. J. A. FARRELL,
President United States Steel Corporation, New York City.

DEAR SIR: Answering you letter of August 31, asking that we submit a statement showing the average hours of rest for the different classes of employees at our several plants, some difficulty has been experienced in having our general superintendents understand exactly what is wanted. From South, Joliet, and Milwaukee Works we have obtained data which in a way answers your question. It is realized that these statements are not in just the form to give fullest information concerning your inquiry, but rather than delay reply longer it is thought best to submit the inclosed statements of the works.

The statement for Gary works will follow later.

Conditions in different departments, and sometimes in the same departments, are so varying as to make difficult a comprehensive statement accurately representative of the departments.

Trusting that the inclosed statements will be of some service to you, I am,

Yours, very truly,

E. J. BUFFINGTON, *President.*

BESSEMER & LAKE ERIE RAILROAD CO.,
Pittsburgh, Pa., October 27, 1911.

MR. C. L. CLOSE,
Committee of Safety, United States Steel Corporation, New York.

DEAR SIR: Answering your letter of the 20th instant, relative to the extent to which this company has put into operation the six-day week, and to what extent hours of labor have been reduced, I inclose herewith letter of Mr. E. H. Utley, general manager, which I hope will give you the information desired.

Yours, truly,

J. H. REED, *President.*

BESSEMER & LAKE ERIE RAILROAD CO.,
Pittsburgh, Pa., October 23, 1911.

Mr. J. H. REED,
President, Building.

DEAR SIR: Replying to letter of Mr. C. L. Close, of the committee of safety, dated October 20, in regard to hours of labor, I quote from the statement compiled for Mr. Farrell and addressed to you September 22, which covers the points raised by Mr. Close:

"Below is given a statement showing the average of active labor and average hours of rest for the different classes of employees in the transportation department, taking the month of August as a basis:

	Average hours of active labor.	Average hours of rest.
	H. m.	H. m.
Superintendent's, and other offices	8 0	16 0
Station agents and clerks	10 0	14 0
Train dispatchers (Federal law)	8 0	16 0
Telegraph operators (Federal law)	8 0	16 0
Linemen	10 0	14 0
Passenger-train service	5 49	18 11
Through freight-train service	11 27	13 12
Conneaut Branch and Wallace Junction drag service	10 54	13 27
Local pick-up service	10 07	13 53
Mine service	10 34	13 26
Construction work-train service	11 42	12 18
Yard service	12 0	12 0
Average, all employees	9 52	14 13

"In the mechanical department we might divide our employees into two classes, those working 10 hours per day and those working 12 hours per day.

"Shopmen's hours are from 7 a. m. to 12 m., and 1 p. m. to 6 p. m., with the hour for dinner between 12 m. and 1 p. m., making 10 hours on duty. While they are on duty for this period of time and are supposed to be working all of that time, yet the nature of the work is such that the task is not arduous. Machinists, for instance, place a piece of work in their machine, and after starting their feed all they have to do is to watch the machine so that nothing unforeseen occurs. Blacksmiths are making forgings or welds, and while their work is hard for part of the time, yet the steel has to be heated in a forge and they are not performing any physical labor in that time, though their attention must be kept on their work to prevent an overheat. A boiler maker's work varies from testing staybolts to flanging flue sheets. He must lay his work out and get the necessary tools together to perform that special job, so that the minutes of hard physical labor are comparatively few, and these have been materially reduced in the last few years by the introduction of pneumatic tools, which take the place of the sledge, the cold chisel, and the strong arm. Flanging flue sheets is hard work, but the work is not continuous, as gauges must be applied and measurements taken at frequent intervals. Electrician's work consists in inspecting wiring, motors, etc., replacing blown-out fuses, winding armatures, and light work of a similar nature. Tinners place jackets on locomotives, roofs on cars, and make buckets, lamps, etc., the material handled all being light. Coach cleaners simply scrub out coaches, wash windows, and such light cleaning. Car repairiers make needed repairs on cars and carpenters and painters perform the usual functions of their respective vocations. All of these classes work 10 hours a day, and from the very nature of their occupations could not be considered as overworked in working 10 hours per day.

"Considering the other classes of employees that work 12 hours per day, we have car inspectors on duty for that period. The amount of work they do depends upon the number of trains handled and is very irregular, especially in winter, during many days of which the men are actually engaged in work less than one-half of their time on duty, while for the entire year the men will be actually engaged in work not over 80 per cent on the average of the time they are on duty. When not engaged in work, the inspectors are expected to be at the buildings provided for rest houses.

"The men who are sent out on the road daily to repair defective cars set out of trains will not exceed 12 hours on duty, and as a great part of their time is spent traveling in passenger trains to and from their work, it is probable that their actual working time is less than 50 per cent of the time on duty.

"The wrecking crews are employed on the shop tracks 10 hours per day in repair work when not on duty with the wreck train. When on wrecking duty, the wreck crew is on continuous duty from the time of reaching the wreck until the track is clear, if not more than 5 or 6 hours are required for the work. If more, the men are allowed time for their meals and such rest periods as the wreck master considers desirable under the special circumstances in each case.

"Three or four times a year on the average the wreck crew is engaged on a wreck where the actual working time exceeds the idle time, the latter including the time required to travel to and from the wreck and the rest periods; at all other wrecks the actual working time is less than the resting time.

"Each wreck train is equipped with a sleeping and dining car equipped with a kitchen, table, and bunks, in which the men are taken care of when not actually engaged in work.

"Engine coalers are on duty 12 hours and in that time average about three hours' rest, their duty being to coal locomotives. Fire cleaners dump the ash pans and grates of locomotives arriving at the terminal and average about 2½ hours rest in 12 hours. Engine watchmen watch engines and keep water in boilers and the fire in proper shape, pipes drained in winter, etc. They are on duty 12 hours and practically have no period of rest, keeping moving from one engine to another. Hostlers, who move engines to and from the roundhouse, average about 2 hours' rest in 12 hours. The crew caller averages 4 hours' rest in 12 hours.

"All of the above 12-hour men are governed in their period of rest by the rapidity with which engines arrive at and depart from a terminal, it varying from day to day as conditions change, though the above figures are a fair average.

"On Sundays there is no work done at all, there being only a sufficient number of men on duty to watch engines under steam and to guard against a possible fire at the various terminals.

"In the chief engineer's department the office hours are from 8 o'clock a. m. until 5 o'clock p. m., with one hour allowed, 12 o'clock to 1 o'clock at noon, for dinner.

"Section foremen and men are all at their tool houses ready to start to work at 7 o'clock each morning, except Sunday. They work until 12 o'clock, noon, take one hour for dinner, resume work at 1 o'clock p. m., and work until 5.30 or 5.45 p. m., leaving work in time to get back to their tool houses, through for the day, at 6 o'clock p. m., working 10 hours per day. One man on each section is detailed to walk over the section each Sunday, which takes 5 hours or less, to see if everything is all right, but they take turns at this, so no one man will work more than one Sunday in each month.

"Extra gang foremen and men are at work each morning except Sunday at 7 o'clock and work until 12 o'clock, noon. They take 30 minutes for dinner, resume work at 12.30 p. m., and work until 5.30 p. m. in order to allow their work trains to get in and tied up by 6 o'clock p. m. Extra gang men live in boarding cars and temporary buildings, both of which are fitted up with bunks and are furnished by the company free of charge to the men. During the busy season when we are running from 25 to 30 trains each way a day, the track men are not able to do any work while trains are passing, and figuring on an average delay to their work of three minutes to a train, there is about one hour and a half out of the 10 they are out that they can not work.

"We have at present six carpenter gangs, one painting gang, two concrete gangs, one interlocking gang, and one water-supply gang. Two of the carpenter gangs work out from their headquarters, going to and from their work on the morning and evening trains, and one gang works in the carpentershop and around the shops at Greenville. The other three carpenter gangs work all along the line and live in boarding cars, which are provided with cots and mattresses, stoves, dishes, and cooking utensils furnished free by the company. The men buy their own provisions. They work from 7 o'clock a. m. until 5.30 or 6 o'clock p. m., taking 30 minutes or 1 hour for dinner at noon, and work 10 hours per day. They do not work on Sundays.

"The two concrete gangs work all along the line and live in boarding cars, fitted with bunks, which are furnished free by the company.

"The masons, water-supply repairmen, and interlocking gangs work out of headquarters, going to and from their work on the morning and evening trains, and work 10 hours per day. They do no Sunday work.

"We have 12 water stations, where the pumpers work turns of 12 hours each; that is, there is a day man and a night man at all of but three of these stations, which, on account of their location, it is not necessary to keep a night man on, whose duty it is to see that there is a good supply of water at all times, but as the pumps are run on an average of but 7 hours during the 12-hour turn, based on the average for the month of August, which was one of our heaviest months, the pumpers have four or five hours each day for rest, and as all the pumps are run by gasoline engines except two, which are run by

steam, their average hours of rest, on account of their being able to rest part of the time while the pump is running, is more than their hours of active labor. At some of the stations it is necessary for the pumpers to work a few hours each Sunday.

"With the exeption of the track walkers and pumpers, there is no Sunday work, except in emergencies."

It would be impossible to reply to Mr. Close's inquiry as to "what extent the hours of labor have been reduced." All that we can say is that the order went into effect May 1, 1910; that our tonnage for the year 1910 was 815,000 tons more than for the year previous, and that in the last eight months of the year we worked only six days per week instead of seven, except in cases of absolute necessity, and that during 1911 we have maintained the Sunday observance and our tonnage is far and away ahead of what it was during 1910; but to analyze and determine to what extent hours of labor have been reduced, can only be guessed at.

The comparison would have to be made between 1909 and 1911, and elements enter into the question such as increased equipment, locomotives, and cars, additional track facilities, and a hundred items.

There is no way to figure it, in fact.

Respectfully,

E. H. UTLEY, *General Manager.*

DULUTH & IRON RANGE RAILROAD CO.,
OFFICE OF THE PRESIDENT,
Duluth, Minn., September 5, 1911.

Mr. J. A. FARRELL,
President United States Steel Corporation,
Empire Building, New York, N. Y.

DEAR SIR: I am in receipt of yours of September 1 regarding statement showing average hours of rest and active labor for the different classes of employees of the Duluth & Iron Range Railroad Co. I judge, from the reading of your letter, that you refer to the actual hours of continuous labor that an employee performs while he is on duty as compared with the actual hours, or parts of hours, that he is able to rest while he is on duty. If that is true, that condition of labor hardly belongs to any part of our railroad work. I know that in the mills some of the men work continuously for a certain length of time and then rest for a short time before taking up their work again. We have nothing of that kind upon which we could give you any definite information in our work.

I am sending you herewith a statement that shows the hours on duty and the hours off duty of men in different departments of our railroad work, and if it is of no value to you in this particular case it may be of some value in the future. Of course, our yardmen and switchmen may work actively for a few hours and then wait a short time for switching work to accumulate, but it is impossible to give any figures in their case that would be at all accurate or valuable. This condition also applies to our tug crews. We have one tug that attends to all of the towing of barges and boats into and out of Two Harbors, and when there is a rush of boats they are quite busy and at other times they are lying at their dock awaiting arrival of boats. We have a fire tug, that is manned by two crews, continuously on duty 12 hours each. They do no work except to be on hand in case of fire, with the exception of occasional small jobs of towing right in the vicinity of their dock, which would not interfere with their prompt response to any fire alarms. All of the rest of our men shown on the list are practically continuously employed during the time they are on duty.

I will be very glad if you will advise me promptly if this information is what you want, or in what respect I can meet your views more fully than I have.

Very truly, yours,

F. E. HOUSE, *President.*

Hours of labor and of rest, the Duluth & Iron Range Railroad Co.

Class of labor.	Hours of labor.	Hours of rest.
Train and enginemen	[1] 16	8
Yardmen and switchmen	10	14
Roundhouse men	10	14
Train dispatchers	8	16
Station agents	10	14
Pumpers (service irregular)	10	14
Shopmen	9	15
Trackmen	10	14
Bridgemen	10	14
Ore-dock men	10	14
Coal-dock men	10	14
Office force	7½	16½
Tug crews	12	12

[1] Maximum.

NOTE.—Eight hours' rest required by law after 16 hours' continual service. Hours of labor vary according to miles run and in no case can exceed 16 hours continuously on duty.

PITTSBURGH STEAMSHIP CO., OFFICE OF THE PRESIDENT,
Cleveland, Ohio, September 5, 1911.

DEAR SIR: I am in receipt of your letter of the 1st instant, with reference to the question of overworked labor, skilled and otherwise. On the Great Lakes, while our ships are navigating, the men have to stand 6-hour watches. We do not ask the men to do any work on Sunday except look after the navigation of the ship. During the season of navigation our boats are kept moving, and the men are pretty constantly employed. This has been taken into consideration in the regulation of wages. We pay higher wages than are paid anywhere else in the world to sailors, and I have not heard of any dissatisfaction among our men. Some years ago there was some dissatisfaction because the men were kept busy cleaning ship on Sundays, but, so far as our fleet is concerned, this has been discontinued for some years.

Yours, truly,

H. COULBY, *President.*

J. A. FARRELL, Esq.,
President United States Steel Corporation,
Empire Building, New York City.

ELGIN, JOLIET & EASTERN RAILWAY CO.,
OFFICE OF THE PRESIDENT,
Chicago, September 5, 1911.

MR. J. A. FARRELL,
President United States Steel Corporation, New York City.

DEAR SIR: Replying to your favor of the 1st instant, in regard to overworked labor, skilled and otherwise, employed in steel works and allied interests:

The railroads have rather a severe penalty for a violation of the hours of labor act. Trainmen must not exceed 16 hours of continuous labor, and before resuming work must have a period of 8 hours of rest. We have no 8-hour shifts for trainmen. Practically all other class of labor is working 8 and 10 hours for a day's work.

Yours, truly,

A. F. BANKS, *President.*

DULUTH, MISSABE & NORTHERN RAILWAY CO.,
Duluth, Minn., September 14, 1911.

MY DEAR SIR: Replying to your favor of the 5th instant, relative to the average hours of rest and labor for the different classes of employees of the Duluth, Missabe & Northern Railway Co., I beg to hand you herewith statement showing the actual hours worked regularly and the regular number of hours of rest which is about the only definite information we can give you on the subject as our men work practically con-

tinuously during the regular hours of labor and there is very little cessation of labor except in a degree. Our fire tug is manned by two crews than work 12 hours each. Each of these crews occasionally performs work in shifting vessels from one dock to another but there is very little hard service with the exception of keeping the vessel cleaned, except when they are called upon for actual work in extinguishing fires. Our employees in the water-supply department work irregularly, sometimes a few hours and sometimes a full quota of 10 hours, depending entirely upon the requirements for water.

I trust this will give you the information you desire, but if there is anything additional required I will be pleased to furnish it promptly upon your request.

Very truly, yours,

W. A. McGONAGLE, *President.*

Mr. J. A. FARRELL,
President United States Steel Corporation,
71 Broadway, Empire Building, New York, N. Y.

Hours of labor and rest, Duluth, Missabe & Northern Railway Co.

Class of labor.	Hours of labor.	Hours of rest.
Trainmen and enginemen	[1] 16	8
Yardmen and switchmen	10	14
Roundhouse men	10	14
Train dispatchers	8	16
Station agents	10	14
Pumpers (service irregular)	10	14
Shopmen	9	15
Trackmen	10	14
Bridgemen	10	14
Ore-dock men	10	14
Coal-dock men	10	14
Office force	8	16
Tug crews	12	12

[1] Maximum.

Trainmen and enginemen: Eight hours rest required by law after 16 hours continual service. Hours of labor vary according to miles run and in no case to exceed 16 hours continuously on duty.

No. 51

UNITED STATES STEEL CORPORATION

HEARINGS

BEFORE THE

COMMITTEE ON INVESTIGATION OF UNITED STATES STEEL CORPORATION

HOUSE OF REPRESENTATIVES

THURSDAY, FEBRUARY 15, 1912

WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

UNITED STATES STEEL CORPORATION.

COMMITTEE ON INVESTIGATION OF THE
UNITED STATES STEEL CORPORATION,
HOUSE OF REPRESENTATIVES,
Washington, D. C., Thursday, February 15, 1912.

The committee this day met, Hon. Augustus O. Stanley (chairman) presiding.

STATEMENT OF PERCIVAL ROBERTS, JR.—(Resumed).

Mr. YOUNG. Mr. Roberts was just going into a new matter at the time we adjourned, I believe, Mr. Chairman.

The CHAIRMAN. Yes. Proceed in your own way, Mr. Roberts.

Mr. ROBERTS. Mr. Chairman, I was just about to start in on the subject of "Old age at forty."

In reference to that matter I have here principally a number of photographs, and some statistics which bear on the subject.

For instance I have here an album which contains the photographs of some 2,200 men working in the Pencoyd Iron Works. It seems that these photographs were taken during the year 1910 by wish of the men, who employed a photographer. The 12 hours turn did not seem to interfere with their vanity at all, because they have insisted upon being photographed here.

Mr. YOUNG. Did the company have anything to do with it?

Mr. ROBERTS. Nothing whatever. This was done by the workmen themselves in the various departments, and represents 2,200 men out of a total then working of 2,300.

The CHAIRMAN. Were these blast-furnace men?

Mr. ROBERTS. This is an open-hearth steel works, a rolling mill making structural materials and structural fabricating shop. There are no blast furnaces in connection with these works, but I submitted this first as giving practically a complete photograph of the total number of men employed there. In other words, they were not selected groups. This represents practically the total workmen of the plant.

I have also here a number of statistical statements showing the number of years employed, the number of men, and their average.

The CHAIRMAN. I would like to hear that. Will you read that?

Mr. ROBERTS. The number of years employed is taken in 5-year turns; first under 5 years; then 5 to 10 years; then 11 to 15 years; then 16 to 20 years; 21 to 25 years; 26 to 30 years; 31 to 35 years; 36 to 40 years; 41 to 45 years; and 46 to 50 years.

Mr. YOUNG. Those are the years of employment?

Mr. ROBERTS. Those are the years of employment at the Pencoyd Iron Yorks. The total number employed is about 2,300.

Pencoyd employees—Years of service as of Feb. 10, 1912.

Number of years employed.	Number of men.	Average age.	Number of years employed.	Number of men.	Average age.
Under 5	876	28.7	26 to 30	28	53.4
5 to 10	539	32.2	31 to 35	18	56
11 to 15	291	39.3	36 to 40	3	62
16 to 20	231	44.2	41 to 45		
21 to 25	110	49.1	46 to 50	1	63

Percentage of English-speaking employees on pay roll, 89.9.
Percentage of non-English-speaking employees on pay roll, 10.1.

Mr. YOUNG. Where is that?

Mr. ROBERTS. At the Pencoyd Iron Works, one of the plants of the American Bridge Co., consisting of an open-hearth steel works, structural rolling mills, and structural fabricating shops.

Mr. YOUNG. What does that term "English speaking" mean?

Mr. ROBERTS. It means that they understand and speak English.

Mr. YOUNG. It has no relation to their race?

Mr. ROBERTS No, sir.

The CHAIRMAN. Do you keep statistics of that kind of all your works?

Mr. ROBERTS. I have here a number of groups of workmen representing the different departments of the Carnegie Steel Co. The photographs number 761 men in the various departments, commencing with the blast furnaces. These photographs will show the age, years of service, and averages. For instance, I have here photographs of 71 men at the Lucy blast furnaces. At those blast furnaces there are a total of 294 employees; 89, or 30.2 per cent, have been employed over 30 years, while 35, or 11.9 per cent, have been employed 30 years or more. That represents that group That is a blast-furnace group [exhibiting photograph].

This is another group of blast-furnace men [referring to photograph]. The average is 58.1 years, and the years of service are 32.3 average. In other words, we have reached 18 years over the 40-year limit in that group.

Here is a group of the Duquesne blast furnaces.

Mr. STERLING. Does that purport to include all the men in that particular furnace?

Mr. ROBERTS. No; that is simply a representative group. The album to which I referred a moment ago includes all the employees, over 2,200 out of a total of 2,300; but these are simply average groups as they comé to me, and from looking at them I should say, from my own knowledge, that they are average groups, but not complete at any one department. They show 761 men.

This is another, the Duquesne blast furnaces [refering to photograph]. Here is one of 52 men of the Carrie blast furnaces. The average age is 46.7 years, and the years of service are an average of 24.2.

We come next to the Duquesne open-hearth furnace.

Now we reach the steel works. This is the open-hearth department. This is an average age of 51 years, and years of service 24.4. This is the Homestead Steel Works.

Here is another one in the open-hearth department. The average age is 53 years, and the average years of service is 31 years.

Here is another one in the open-hearth department, average age 48 years, average years of service 24 years.

Now we come to the finishing mills, the rolling-mill department at Homestead. We have an average age here of 49 years, and average years of service 25 years.

Another one of the finishing mills at Homestead, 49 years average age and 25 years of service.

Mr. STERLING. I believe you should designate what you are looking at there so that it will appear in the record as to just what you refer to.

Mr. ROBERTS. Possibly I should, for these photographs will not go into the record.

Mr. STERLING. No.

Mr. ROBERTS. I am exhibiting certain typical groups of employees of the Carnegie Steel Co., commencing with the blast furnaces and extending through the open-hearth department, their rolling-mill department, their forge department, their armor-plate department, and their mechanical department.

The Homestead Steel Works, plate department, number of men 61, average age of above men 47.50 years, average years of service 24 31/61 years.

Homestead Steel Works, beam mills, and yards; that is a group of the yard men [exhibiting photograph].

Mr. BARTLETT. Observing these men on this photograph that I have in my hand, No. 10, I see No. 2 is 44 years of age and has been in the service 28 years. That means that he commenced at 16?

Mr. ROBERTS. Very likely, yes. These men have all gone into the works as young men, in the lower positions, and worked their way up.

Mr. BARTLETT. And there is another one here, No. 12, 45 years of age, who went in at 15 and has been in the service 30 years.

Mr. ROBERTS. That is undoubtedly correct, Judge Bartlett.

Mr. BARTLETT. It appears to me, from just glancing at it, that he is not as happy and well preserved as the others. I do not know. What sort of work did a boy 15 years old do?

Mr. ROBERTS. Some of these men are undoubtedly like milk cows. You do not pick the beefy ones to be the strongest by any means.

Mr. BARTLETT. No.

Here is one, No. 33, 41 years old, who has been in the service 24 years. That means that he must have started at 17.

Mr. ROBERTS. In those early days, Judge Bartlett, there was no such strict rule as to 16 years of age as there has been later. Some of those boys entered the works probably below the age of 16.

Mr. BARTLETT. What would a boy 15 years old do?

Mr. ROBERTS. He possibly attended to keeping buckets filled with water for the men to drink, or pulling open a door to the furnace, or something like that. It was not excessive labor.

Mr. DANFORTH. How were these men selected who are represented in these groups in the photographs?

Mr. ROBERTS. They report that they are taken as typical, average groups.

Mr. DANFORTH. For instance, here is the Homestead Steel Works, plate department; 20-year service men.

Mr. ROBERTS. They have taken a group of men in service 20 years.

Mr. DANFORTH. Do you suppose that is the entire group of the men who have served that length of time?

Mr. ROBERTS. That is the entire group of the 20-year service men in that one particular department, yes.

I have here the Homestead Steel Works, beam mills and yards, average ages of the above men 55 years, average years of service 32 years.

I have here the Homestead Steel Works 38 and 39 inch mills; average age of above men, 54 years; average years of service of the above men, 30 years.

Homestead Steel Works, plate department: Average age of above men, 49.7 years; average years of service of the above men 31⅛ years.

Here is another group of rolling-mill men, Duquesne Works: Average age, 48.4; average years of service, 22.9.

Homestead Steel Works, Howard axle department, 46 men: Average age of above men, 50 years; average years of service of above men, 25 years.

Homestead Steel Works, Howard axle department: Average age of above men, 55 years; average years of service, 32 years.

Armor plate department: Average age, 51.3 years; years of service, 25.2 years.

Homestead Steel Works, mechanical department: Average age of above men, 50 years; average years of service, 25 years.

Mr. REED. There are 89 men in that department over 20 years in the service.

Mr. ROBERTS. Homestead Steel Works, beam fitting and finishing department: Average age of above men, 47 years; average years of service of above men, 22 years.

Homestead Steel Works, mechanical department: Average age of above men, 58 years; average years of service of above men, 32 years.

Homestead Steel Works, structural department: Average age, 48 years; average years of service, 25 years. This illustration is somewhat outside of the works, but the legend on it reads:

This man was born September 13, 1847, and started to work at the painter mills September, 1858; was employed continuously at this mill as pull-up, lay-off, poke-in, hook catcher, heater's helper, heater, and hookman until January 1, 1911, at which time he retired on pension.

This man commenced working at 11 years of age; worked continuously 53 years; and at the present time is 64 years of age. The picture represents a family group of the man, his wife, and youngest child, a boy of 13 years.

Mr. STERLING. Do you know what per cent of these men own their home?

Mr. ROBERTS. I have no record of that.

Mr. STERLING. Would you say quite a percentage of them do?

Mr. ROBERTS. I should say it was a quite large percentage. I think there is some data on that in some of these other departments.

The CHAIRMAN. Have you any groups here of roughers and catchers?

Mr. ROBERTS. You will find those in what is termed the rolling-mill department.

The CHAIRMAN. I mean in the tin-plate department.

Mr. ROBERTS. Those are all the Carnegie mills in Pittsburgh. None of these figures cover the tin-plate plants. They cover the Homestead and Duquesne plants only.

That covers, I believe, the question of "Old age at forty."

Mr. BARTLETT. Is there any way of determining whether these are native-born Americans, or whether they are foreigners?

Mr. ROBERTS. That could be ascertained by means of the key numbers which you will notice. I have no doubt that information could be filed if you would like to have it. You have noticed that there are numbers on the photographs which evidently will enable them to trace the name of the workman.

Mr. REED. Most of the men who have been in the service more than 20 years are native Americans, English, or Irish.

Mr. ROBERTS. Or naturalized citizens.

Mr. REED. Very few southern Europeans have been in the service that length of time.

Mr. BARTLETT. I take it for granted that this No. 12 is an American.

The CHAIRMAN. Have you any figures to show what percentage of the employees of the United States Steel Corporation, the 200,000 men employed, have been in the steel business for more than 20 years?

Mr. ROBERTS. No; I have not, as a whole.

The CHAIRMAN. Have you any figures to show, outside of the transportation—because you appear to have no figures as to that—what per cent of the entire number of employees of the United States Steel Corporation are American born?

Mr. ROBERTS. I have not; no.

There are five points more which I want to touch upon:

First, sanitation and welfare.

Second, voluntary relief plan.

Mr. REED. Accident relief, you mean?

Mr. ROBERTS. Voluntary accident relief plan; yes.

Third, accident prevention.

Fourth, pension.

Fifth, profit sharing.

I shall take but a very few moments to cover these remaining points.

I would say in reference to those five subjects, that the corporation has been accused of putting those things in effect to hold their men in their employ.

In reply to that I would say that the purpose of that policy is for the betterment of the men; and that it naturally follows that where a man can better his condition, he is likely to remain.

If, on the other hand, we would follow the converse of that proposition, whereby the longer a man was in our employ, the more he desired to leave, I think you would at once agree with me that we would either be imbecilic or fit for the lunatic asylum. A man will continue where it is for his interest to do so.

I have here a brief statement as to what has been done in regard to sanitation and welfare which, if I may, I will read. It is a short statement [reading]:

Sanitation and welfare work: All companies have been actively engaged for a number of years in bettering the workman's condition. Special men have been employed to make a study of the conditions and to make suggestions for improvements. Recently a committee was appointed by Judge Gary, consisting of five members, representing different companies, known as the sanitation committee of the United States Steel Corporation.

The functions of the committee are about the same as the safety committee acting as a clearing house, receiving and disseminating among all the subsidiary companies ideas and suggestions for improving and bettering the workman's conditions. They also conduct inspections and employ special engineers where necessary to make these inspections in order to get the best possible ideas on this work. Dr. William Darrach, of New York; Dr. Thomas Darlington, former health commissioner of New York, and other prominent people have been employed and have made special investigations, extending over a period of from three weeks to as many months and covering all of the corporation's plants and mines. These investigations covered hospitals, care of the injured, sanitary conditions, etc. Emergency hospitals have been installed at all plants in charge of competent surgeons and nurses. One of the most modern hospitals in the United States has been built by the Illinois Steel Co. at a cost of about $250,000.

Sanitary engineers are now permanently engaged in some of the companies who spend their entire time studying and investigating conditions around the plants and mining camps. Drinking water and the disposal of fecal matter in mining camps where there are no sewers or water systems are being given special attention. Drinking water is analyzed, and if found to be contaminated no one is allowed to use it, and a new source of supply is provided. In our mining camps there are regular and periodical collections of feces, and it is disposed of either by incinerating or placing in septic tanks. Garbage is also collected and disposed of at regular periods.

Mr. BARTLETT. That is at all your plants?

Mr. ROBERTS. This is where the housing is under the control of the corporation.

Mr. BARTLETT. It is not under the control of the corporation at Homestead?

Mr. ROBERTS. No, sir; none of it [continuing reading]:

Special attention is given to commissaries. The meat markets are entirely screened off from the balance of the store; marble slabs are used for counters. Fruit and vegetables are kept screened so flies can not come in contact with them. Regular inspections are made by a sanitary engineer to see that the stores are kept clean and that everything is done in a sanitary manner.

All plants are being equipped with good drinking-water systems; sanitary drinking fountains are provided so as to avoid the spreading of disease from one to another.

During the period of 18 months ending June 30, 1911, there was expended by the companies $836,632.77 for the improving of workmen's conditions. The following is a partial list of the items it covered:

Emergency hospitals (does not include Gary), retiring rooms, sanitary toilets, drinking-water systems, sanitary drinking fountains, ventilating and cooling systems, athletics, swimming pools, ball grounds, etc., improving dwellings, club houses, shower baths, providing plots for vegetable gardens, donations to hospitals and charitable institutions.

Other items not taken into account in the above are: Selling coal to employees at cost, renting houses to employees for building homes at lower rates than the legal interest, loaning money to reputable employees to relieve distress and charging no interest.

Mr. GARDNER. Are those things free to the men—the swimming pool, hospitals, and things of that kind?

Mr. ROBERTS. I so understand; yes, sir.

Mr. GARDNER. They do not have to pay any dues?

Mr. ROBERTS. No; I understand these are all entirely free.

Mr. BARTLETT. Just as a matter of record, is there anybody here who can state positively on that?

Mr. ROBERTS. Mr. Close, who is the chairman of the safety committee, advises me they are absolutely free.

Mr. YOUNG. That is not true of all the hospitals, is it?

Mr. ROBERTS. That they are free to the men?

Mr. YOUNG. Yes.

Mr. CLOSE. Yes; free treatment is provided in cases of injuries.

Mr. YOUNG. Oh, yes; but is it not true that in some of these plants at least the men contribute something to a fund for medical attendance and hospital service?

Mr. ROBERTS. I do not understand that the men contribute anything.

Mr. CLOSE. Not in any of the plants. They do it in the Northwest.

Mr. ROBERTS. In the mining companies.

Mr. Close says that in the iron mining region they contribute to the fund; but in none of the industrial plants.

Mr. GARDNER. Is that free treatment provided in case of disease, or in case of accident, or both?

Mr. CLOSE. Both; in the Northwest.

Mr. ROBERTS. I understand that it is free in both.

Mr. BARTLETT. I understand, that for the use of these gymnasiums and other things that you have mentioned, the men are not required to pay any tax, by way of dues or anything, in order to belong?

Mr. ROBERTS. They are absolutely free, as I understand.

Mr. BARTLETT. And accessible to all who frequent them and comply with the regulations?

Mr. ROBERTS. To all who are residents in these localities.

Mr. YOUNG. Is not this the situation at the iron mines: That the men pay in a certain amount—I think it is 50 cents a month, or something like that—into a fund; that this entitles them to medical attendance for themselves and their families, all single men to the use of the hospitals, and all married men to the use of the hospital in case of accident or of such severe disease that they can not be properly taken care of at home; and that the rest of that expense is paid by the company. Is not that the situation at the iron mines?

Mr. DANFORTH. You mean at the iron ore mines?

Mr. YOUNG. Yes.

Mr. Close says that is correct, so far as the Northwest mining and transportation employees are concerned; that is, the Lake Superior ore region and the railroads of the Lake Superior region; but that it applies nowhere else.

Mr. BARTLETT. In addition to those things, do you know whether or not they have other things, like social clubs and things of that sort, as to which they themselves determine the membership and pay the dues?

Mr. ROBERTS. I think a great many of these associations are largely carried on by the Young Men's Christian Association, and contributions are made. For instance, there is a large new building at Gary, which has recently been built by Judge Gary, who presented that to the town.

Mr. YOUNG. Right there, is it not true that in the iron mines, also, in answer to Judge Bartlett's suggestion, they have, almost invariably, what is called the Miners' Club, to which most of the miners belong, and to which they pay dues, and from which they receive sick benefits and death benefits?

Mr. ROBERTS. I think that is true. I think there are some details in regard to those matters in the file which I presented here yesterday. There is a statement regarding the conditions in the ore region by the president of the Oliver Mining Co., who gives a number of

details in regard to those matters. I did not read the letter yesterday, because I did not want to take up too much of the time of the committee.

Mr. YOUNG. Do not the mining companies contribute to these club funds, and are they not distributed to the men by a committee appointed by the men themselves, who determine whether they are entitled to the benefits or not?

Mr. ROBERTS. As to the details of that I am not informed, and I can not give you accurate information on that point.

Mr. YOUNG. Is that right, Mr. Close?

Mr. CLOSE. Yes, sir.

Mr. ROBERTS. I am informed that that is correct, Mr. Young.

Mr. STERLING. How long has this welfare plan been in operation, Mr. Roberts?

Mr. ROBERTS. It was agitated and discussed soon after the formation of the Steel Corporation. It has been a gradual development. I can not fix any definite date. It commenced almost with some of the first meetings of the executive committee, as far back as 1901.

For instance, I very well recall, while I was on that committee, offering a resolution in regard to profit sharing.

It took time to develop these matters, however. They are not completed, by any means. All these five subjects that I have mentioned are still in tentative shape. They are experimental. We do not know. They are not perfect by any means. There is room for improvement in all of them, and from time to time we are trying to adapt them to the conditions, in the best way we can.

We have before us at present the question, in the profit-sharing plan, of enabling men to take a longer time to pay for their stock than is now permitted—that is, in the case of men whose average yearly earnings are under $800 a year, that they shall have a greater number of years in which to pay for their stock than those whose yearly earnings are over $800.

In other words, we are feeling our way in all these things. It is a good deal of an exploration. We are getting into grounds that have not been trodden before. We do not know where we are going.

Mr. STERLING. It was said here, before this committee, that the Steel Corporation had adopted this plan for the purpose of holding the men. It has been charged that it was the purpose of the corporation to create a sort of a condition of slavery among the men.

Do you know how the men themselves feel about it? Do you know of any complaints on their part, or any murmurs which you hear of, disapproving of the plan in any way?

Mr. ROBERTS. I have never heard the slightest intimation of that kind. It is entirely voluntary. All of these plans are entirely voluntary. They are not compelled to enter into them. Their self-interest, however, dictates to them that they should do so. Consequently, our one thought in the matter is better conditions; and, in bettering conditions, naturally it follows that a man wants to remain where his conditions are better than they would be elsewhere; but, as for its being for the purpose of holding our men in anything like duress, there is no such thing at all.

Mr. STERLING. I suppose the steel company, assuming that it is doing this work in good faith—which, personally, I have no doubt

about myself—if they felt that it was creating dissatisfaction among the men, would feel that the plan was a failure?

Mr. ROBERTS. Why should they spend money to perfect these plans—millions of dollars every year—if it were creating discord among the workmen?

Mr. STERLING. I presume the steel company expects to get returns from it in the fact that the men are better satisfied, in better condition, and that if it did not accomplish that end they would consider that their plan had not succeeded. Is not that true?

Mr. ROBERTS. There is no worse policy for any industrial corporation than a discontented employee.

It is our best policy to have our employees contented; and if, in producing these plans, we produce more contentment, we are better by it; not only the men better by it; the company betters by it.

Mr. BARTLETT. It is good business policy?

Mr. ROBERTS. It is good business policy.

Mr. BARTLETT. It is good business policy to have your men as well housed and as well cared for as possible, in hygienic houses, and to provide them with these other surroundings of the sort you have mentioned, to make them comfortable and contented, than it is simply to work them as a human machine and get all you can out of them?

Mr. ROBERTS. Absolutely. There is nothing more important in any industrial undertaking than the loyalty of all that are concerned in it, both officers and employees; and, as I said a few moments ago, nothing will produce that more than contentment with one's condition.

Mr. BARTLETT. And in order to make them contented, you must make them as comfortable as possible?

Mr. ROBERTS. I agree with you; yes, sir.

Mr. BARTLETT. Both in reference to their necessary natural wants and their surroundings pertaining to their social life and the leisure moments of the men?

Mr. ROBERTS. Both within the works and without, to as great an extent as you can go.

Mr. BARTLETT. Will it interrupt you for me to ask another question before you proceed?

Mr. ROBERTS. I shall be happy to answer any questions, Judge Bartlett.

Mr. BARTLETT. What are the conditions with reference to churches at these places?

Mr. ROBERTS. I have some statistics in that respect that I shall reach in a few moments, Judge.

Mr. BARTLETT. All right.

Mr. ROBERTS. I continue to read from this statement concerning "Sanitation and welfare work":

Children's playgrounds are contemplated and being installed by the subsidiary companies in all localities where we have plants. These are equipped with modern devices for play and exercise, the company paying for an attendant to look after the children.

District nurses have been employed by some of the companies, whose duties are to go from home to home, relieving distress and teaching the women how to take care of the sick, care of babies, and in fact everything that will tend to better their home conditions.

During the depression of business in the winter of 1907–8 thousands of dollars were expended for the workman and his family to relieve distress. No one was allowed to suffer the want of the necessities of life. Coal, groceries, clothing, etc., were furnished to those who were in need, without cost. Committees were appointed and special investigations were made in order to take care of the modest ones, who would not apply for aid. It was seen to, and is to-day, that no employee or his family suffer the loss of the necessities of life.

That applies to sanitation and welfare.

The next subject I will touch upon is the voluntary relief plan [reading]:

This plan of relief went into operation May 1, 1910, and is a purely voluntary provision made by the corporation for the benefit of employees injured and the families of employees killed in the service of the subsidiary companies. The entire amount of money required to carry out the plan is provided by the companies, with no contributions whatever from the employees. The principal features of the plan are as follows:

The companies provide treatment by surgeons and hospitals.

Relief is paid regardless of liability.

No relief is paid for the first 10 days of disability.

Temporary disability.—Single men: Thirty-five per cent of wages up to 52 weeks; 2 per cent added for each additional year of service over five years; maximum, $1.50 per day.

Married men: Fifty per cent of wages up to 52 weeks; 2 per cent added for each individual year of service over five years; 5 per cent added for each child under 16 years of age; maximum, $2.50 a day.

Permanent disability.—Loss of a hand, 12 months' wages; arm, 18 months' wages; foot, 9 months' wages; leg, 12 months' wages; eye, 6 months' wages.

Permanent total disability.—Such an amount as shall be required to make suitable provisions for the injured man, but in no case less than the death relief for such a man.

Death.—Funeral expenses not to exceed $100. Single men: No dependents—funeral expenses up to $100. Married men: Eighteen months' wages; 3 per cent added for each year of service over five years; 10 per cent added for each child under 16 years of age; maximum $3,000.

The plan was printed in about 16 different languages and a copy was given to each employee, and one is given to each new employee as he goes to work.

During the year 1910 about $1,500,000 was paid to and for injured men and families, which is about 76 per cent of the total expenditures in casualty matters—an increase of nearly $700,000 over the year 1906, regardless of the fact that the serious and fatal accidents were 43.2 per cent less than in 1906. The increased payments to injured employees in 1910 was 43 per cent. Average death payment was $1,438.27.

Suits were brought in but thirty-seven one-hundredths of 1 per cent of the total accidents, and practically 95 per cent of the accidents are now settled within the provisions of the plan.

A copy of the plan is attached hereto.

I think that speaks very well for the benefits of that arrangement.

The CHAIRMAN. Speaking of suits, does this benefit apply whether the suit is brought or not, or has the man the option of taking the benefit or bringing suit?

Mr. ROBERTS. He has the option of bringing the suit or taking the benefit of the plan, I believe, after the accident has occurred. He does not have to elect when he enters the employ of the company.

The CHAIRMAN. But after the accident has occurred, if he takes the benefit of the plan, he must take it in lieu of recompense through the means of a suit?

Mr. ROBERTS. In lieu of legal proceedings; yes.

And apparently, as I say, from that statement, in 95 per cent of the accidents which have occurred since that has been put into effect

the men have volunteered to take the plan rather than resort to legal proceedings.

Mr. BARTLETT. I think I understand it, but I want to ask you about this:

You mean by this that this means that these benefits are paid at the death of your employee by your company, of its own motion, without any assessment upon the men, and whether the company regards itself as legally liable for the accident or not?

Mr. ROBERTS. That is correct, sir.

Mr. STERLING. The men do not have to contribute anything to the relief fund?

Mr. ROBERTS. Nothing whatever.

Mr. STERLING. You do not inquire into the question of negligence at all?

Mr. ROBERTS. No, sir. The question of negligence has nothing to do with it.

Mr. STERLING. Has the company instituted any safeguards to prevent accidents?

Mr. ROBERTS. I am coming to the question of safety next—accident prevention.

Mr. REED. I think Mr. Gardner had a question that he wanted to ask in regard to this plan.

Mr. GARDNER. How long after the accident does the employee have the option of deciding whether he will resort to his legal remedy or accept the voluntary relief offered by the company?

Mr. ROBERTS. I will submit in evidence, Mr. Gardner, the entire printed plan of this voluntary relief, which will give all those details.

Mr. REED. That has already been printed in the record.

The CHAIRMAN. Does that contain the resolution about which you spoke to me, Mr. Reed?

Mr. REED. This has nothing to do with profit sharing, Mr. Chairman.

Mr. GARDNER. I think somebody said the period was 50 days. I am not sure.

Mr. ROBERTS. I think it has appeared somewhere in the record that the men have up to 90 days, but——

Mr. REED. You are thinking of the New Jersey workmen's compensation act. That has the provision you refer to.

It is my impression that the men have any time at all up to the period of the statute of limitations.

Mr. GARDNER. What does Mr. Close say?

Mr. CLOSE. There is nothing in there about the length of time.

Mr. YOUNG. I know, as a matter of practice in mining ore there is no limitation on the time.

Mr. ROBERTS. I have never seen any limitation.

Mr. REED. I have known them in my practice to come in years after the accident and get their relief.

Mr. CLOSE. Four years afterwards.

Mr. ROBERTS. You say they may come in any time after four years?

Mr. CLOSE. There is no time fixed. We have settled cases four years after the accident.

Mr. REED. In Pennsylvania the statute of limitations limits the time to two years for injuries and one year in case of death.

Mr. ROBERTS. My reply to that question would be that there is no time limit other than the statutory limit provided by the statute of limitations.

Mr. GARDNER. They may avail themselves of the legal remedy, provided they have not taken the accident benefit?

Mr. ROBERTS. If they have taken the accident benefits they sign a release.

Mr. GARDNER. But they can call for that accident release at any time up to the expiration of their legal rights?

Mr. ROBERTS. Yes.

Mr. GARDNER. Can they call for it after the expiration of the statutory period?

Mr. REED. They can; and they will get it. But the option to sue is then gone, because it is barred by the statute.

Mr. GARDNER. But when they have lost their option to sue you do not say to them, "You have forfeited your other option to receive the benefit under the plan"?

Mr. REED. Not at all.

Mr. GARDNER. They can have that up to the time they die if they choose?

Mr. REED. Yes. Of course, we have not any instances of a long period elapsing before an application is made, because the plan has only been in force a little less than two years.

Mr. ROBERTS. I think largely they are of a character that need the money as they go along.

Mr. BARTLETT. You would soon find out whether they would accept it or not by knowing their condition and knowing their needs and carrying out your policy and plans. I suppose you have some one who looks after that.

Mr. ROBERTS. I think they would all be attended to within a reasonable time.

Mr. GARDNER. As a matter of fact, in your opinion, is this an economy for the company as well as for the men?

Mr. ROBERTS. I think it is a benefit to both parties.

Mr. GARDNER. That is, in saving Mr. Reed's bills, for instance?

Mr. ROBERTS. I would say that, so far as my experience and knowledge of the matter goes in the old state of things, the injured man in many cases obtained very little of what he recovered in suits brought against his employer.

There was a class of men known as "ambulance chasers," who took the injured man to the hospital and then solicited his case, and took the case on a percentage basis. In other words, if they recovered nothing, they got no fee; and if they recovered anything, they received a very large portion of the recovery as a fee.

Mr. BARTLETT. They got it all?

Mr. GARDNER. It seems evident that the present arrangement is considered by the men as better for them, because 99 per cent of them have availed themselves of the opportunity to take the benefit under it. I wondered if it was at the same time a saving to the company, too?

Mr. ROBERTS. From the standpoint of the corporation it is an increased expenditure; but from the standpoint of its relation to its employees, it believes that it benefits by this increased expenditure.

Mr. GARDNER. I understand that. What I am trying to get at is whether, in your opinion, it saves the corporation dollars and cents because they do not have to defend these accident suits?

Mr. ROBERTS. No; there is no saving in money to the corporation.

Mr. GARDNER. It is an expense?

Mr. ROBERTS. This is an increased expenditure on the part of the corporation over and above the old methods of casualty insurance.

Mr. GARDNER. Have you estimated what the increased expense is in two years for which this plan has been in operation?

Mr. ROBERTS. I have just read those statistics, sir, I think.

Mr. GARDNER. But you showed what the actual expense was; not what the increased expense is?

Mr. REED. Yes, Mr. Gardner, he showed the increased expense, too.

Mr. ROBERTS. The increased payments to injured employees was 43 per cent in 1910.

Mr. REED. Over what years?

Mr. ROBERTS. Over what it had been under the old system, although the accidents were 43 per cent less.

Mr. GARDNER. As compared with the year 1908, or as compared with an average of 10 years?

Mr. ROBERTS. That was as compared with the year 1906.

Mr. GARDNER. And were there substantially the same number of employees in 1906 as there were in 1910?

Mr. REED. There were more in 1906.

Mr. ROBERTS. There were more in 1906, I think.

Mr. GARDNER. I should say your answer would be, then, that it is an increased expense to the corporation?

Mr. ROBERTS. It is an increased expense to the corporation; yes, sir.

Mr. YOUNG. Do you believe that, in bringing about better relations with the men, the company really gets that back; benefits by it in the long run?

Mr. ROBERTS. I believe they do. I believe it is good policy.

Mr. BARTLETT. Have you read the newspaper report of the employees' compensation commission report, I think it is, which they propose to have introduced as a bill in Congress along that line, with reference to all corporations engaged in interstate commerce?

Mr. ROBERTS. I have seen such general statements of it, Judge Bartlett, that I would hardly be prepared to express an opinion. I think, though, that we shall have to come to something like that. It is only a question of how to get at it. I believe in it thoroughly. If you do not do it in one way, you do it in another. We would do it by subscriptions to charitable organizations or otherwise.

Mr. BARTLETT. I was going to speak about this report that I have seen in the newspapers. I have not been able to see the report itself. It provides that the employee who accepts this compensation shall not have the right to sue, and that he must elect one or the other, just as is the case with your plan which you have described here.

Mr. STERLING. He can not elect, Judge, under the bill that has been prepared.

Judge BARTLETT. Are you on the commission?

Mr. STERLING. No; but I introduced the original resolution, and I have followed it pretty closely.

Under the bill, as the commission prepared it, the men can not elect. They are bound to take the remedy under the compensation law, if it becomes a law.

Mr. BARTLETT. So that that is to take the place of all legal proceedings in the way of compensation for injuries by employees, at common law or under the statutes?

The CHAIRMAN. As I understand, Mr. Roberts, whenever an employee accepts this compensation, then, by accepting the compensation, or any part of it, he agrees not to seek any other remedy or recompense for his injury at law?

Mr. ROBERTS. I do not understand that he does so by accepting any part of it. If he accepts this plan he releases any legal rights he may have.

The CHAIRMAN. Then, if a man is hurt, if he loses a leg or an arm, and he accepts so much money under this plan for these weeks of maintenance, as soon as the first payment is made that operates as a release to the company for any other liability than the liability provided for under the plan?

Mr. ROBERTS. No. I understand that the final payment would release the liability of the company, the same as would be the case with any other contract. It would be an unperformed contract until its completion.

Mr. REED. If I may interrupt for a moment: The system is that where the payments are made periodically, the company contracts with the man, when he accepts compensation, that he shall release them from any legal liability, while it binds itself to pay these payments, according to the plan.

The CHAIRMAN. I understand that is the condition precedent to his receiving this relief.

Mr. REED. Certainly.

Mr. ROBERTS. It is a contract, and nonperformance on the part of either party to the contract would be fatal to the contract.

Mr. BARTLETT. Mr. Reed, ordinarily are the recoveries for injuries very much larger than the payments provided for?

Mr. REED. No, sir. I do not know whether you want me to testify or not. I have tried all of the Steel Corporation cases in Pittsburgh for the last five or six years, and we have not paid more than half a dozen verdicts; and the biggest one was $6,500.

Mr. BARTLETT. What would that man have received under the plan, probably?

Mr. REED. That is very much more. It is probably twice as much as that particular man would have received for that injury.

Mr. BARTLETT. But he would have received it all without any expense to him?

Mr. REED. By the time he collected his part of the verdict, I imagine he did not get very much more than he would have received under the plan; and he got it several years later, after a long fight and a great deal of uncertainty.

Mr. STERLING. I think this commission on workmen's compensation reached the conclusion—I do not know whether they have the statistics for it or not—that there are 90 per cent of railroad accidents

for which recovery could not be had under common-law principles of negligence or contributory negligence.

Mr. REED. Judge Sterling, under our common law, which is still in force in Pennsylvania, the employee has not a chance of recovery in two cases out of a hundred.

Mr. STERLING. Do you think 2 per cent would be right?

Mr. REED. Yes. I think that would be more nearly correct.

Mr. STERLING. Mr. Roberts, you stated that the number of injuries had decreased 43 per cent since the adoption of this relief scheme?

Mr. ROBERTS. As compared with the year 1906, I think.

Mr. STERLING. What has the company done to bring about that reduction in accidents?

Mr. ROBERTS. Now, I will go to the topic——

Mr. GARDNER. Before he gets on to that, I would like to ask a question.

Is it your opinion, Mr. Roberts, that the burden for accidents—I mean accidents which just happen—should be borne by the employer or by the community?

Mr. ROBERTS. That is a general question rather than one applying to the steel industry as a whole or to the Steel Corporation.

Mr. GARDNER. Unless you have given that question thought I do not care to press you for an answer.

Mr. ROBERTS. I think it would possibly vary, depending upon local conditions, to some extent. For instance, if you have an industrial community which has been developed by an individual establishment, it would hardly seem that accidents should be borne by the community as a whole when there may be 99 per cent of the workers in that individual industry. On the other hand, we have large communities, municipalities, and so on, where such costs are now borne by the community in general. Our almshouses, our hospitals, and our charitable institutions show that. But whether it should be, as in some European countries now, that the employers in any one trade or business should bear the injuries is another way of looking at it. That is the way the Steel Corporation has looked at it. As a whole, they have said this industry, so far as we are concerned, will bear the burden of these accidents, and it is a part of our charge. In other words, when you get at it, it really goes back to the public providing for them, because it is included in the selling cost of the materials.

Mr. STERLING. The ultimate end of all these compensatory laws will be that the public will bear the burden?

Mr. ROBERTS. That is my opinion.

Mr. STERLING. You say you count it as one of the charges of production?

Mr. ROBERTS. Necessarily so.

Mr. STERLING. So if the railroads should insure against accidents, as they do in European countries, they will make that as a charge in the cost of transportation, and it will ultimately fall on the public?

Mr. ROBERTS. The consumer is the ultimate bearer of all this thing.

Mr. STERLING. Is not that apt to fall on the public in cases where there is no question of negligence in these 90 cases out of 100? Should it not fall on the public?

Mr. ROBERTS. It does now, in one way or another. It always has. In cases of injury we do not destroy the injured. If they are unable to provide for themselves the public provides for them.

Mr. GARDNER. An immediate instance was what I meant. It is a great question, and different countries are going in different directions on it. But, in your opinion, if the instance was on the whole steel industry, as it is, I think, in general, or if the instance was on the whole community, whether by city or State or by Nation, would not the effect be to discourage individual employers from efforts in providing safety appliances?

In other words, by making the immediate instance on the employer, does not that tend at all times to drive the employer to working his brain to protect his men against injury?

Mr. ROBERTS. It might have more effect on some than on others, Mr. Gardner, I think. You take a large aggregation of capital, such as the Steel Corporation is, with its large tonnage, they are able to take precautions and make expenditures which a smaller aggregation of capital or an individual would not be able to do. For instance, if they set aside a cent a ton, or something like that, the total amount makes a very large amount, which can be expended for such purposes as this, whereas a producer with a small tonnage is not able in his current business to operate in the same manner.

I believe that conditions among operatives would be made much better on large-scale operations than they can on small.

Mr. GARDNER. You have stated the other side of the question exactly. That is the argument that is made by those who think a whole industry ought to bear it. I was stating the argument which seemed to appeal to me more directly, and that was from the point of view that no man would get hurt for the sake of his relief; that it tends toward the safety of employees to make the original instance on the company in whose work a man is employed.

Mr. ROBERTS. Personally I should prefer each tub to stand on its own bottom. I would rather provide for my own employees and let it stop there, than to provide against the carelessness of some competitive employer, who did not take particular precaution. In other words, as a proposition to the Steel Corporation, I should prefer it would stand on its own individual bottom, because I believe it is doing more to prevent accidents than any of its competitors.

Mr. BARTLETT. Do you know Mr. Dixon?

Mr. REED. W. B. Dixon?

Mr. ROBERTS. Who is vice president of the Steel Corporation?

Mr. BARTLETT. Yes.

Mr. ROBERTS. I do.

Mr. BARTLETT. Did he aid in establishing or suggesting this plan?

Mr. ROBERTS. That I am unable to say. I do not know what part he played in it.

Mr. BARTLETT. He was on the New Jersey commission appointed by the governor, which reported on the plan as adopted by the New Jersey Legislature; was he not?

Mr. ROBERTS. During these years when these plans were introduced I was not connected with the corporation, and I am therefore unable to say.

Mr. BARTLETT. Do you know whether or not the railroads and companies, in keeping their books, accounts, and things of that sort—

do you know where they place the money they lay up for accidents? Under what subject or heading they are put?

Mr. ROBERTS. No; I can not speak further than the Pennsylvania Railroad in that matter; and there they have in their annual report the amounts.

Mr. BARTLETT. I know, but what do they call it?

Mr. ROBERTS. That is termed their "accident relief," and it would come out of operating expenses, what they contributed toward their accident relief.

Mr. BARTLETT. It would be a charge on the company, in considering what would be a reasonable rate of freight or passenger service, would it not?

Mr. ROBERTS. I think so; and operating expenses.

Mr. BARTLETT. In that way the public would pay finally, in the case of railroads, certainly if not in the case of the Steel Corporation or other corporations, under this plan.

Mr. ROBERTS. They would in this way ultimately pay, not necessarily pay. It may come out of the profits of the corporation if those profits were sufficiently large. But if you are running with practically no margin over costs, then the public would pay it. It is just a question whether it comes out of profits or not. If there are no profits, it is an additional cost; it makes your profits that much less.

Mr. BARTLETT. If the Government should assume a plan of regulating these large corporations engaged in interstate business, manufacturing, and business corporations, of regulating their practices, in order to have a reasonable return on their money, it would seem that they necessarily would have to take this into consideration.

Mr. ROBERTS. I hope you and I, Mr. Bartlett, will never see that day come.

Mr. BARTLETT. I am glad you have said that. I certainly hope so myself.

Mr. YOUNG. Could you tell, offhand, how much per ton of the products of the Steel Corporation this charge amounts to?

Mr. ROBERTS. I think the amount expended was about a million and a half. That would be about 10 cents a ton.

Mr. YOUNG. Do you think that anybody that bought a keg of nails would ever know the difference; that it would make any difference in the price at which you sold them?

Mr. ROBERTS. No; it would come out of the whole profits.

Mr. YOUNG. What do you think it would be on a ton of plates?

Mr. ROBERTS. I think up to date it has made the Steel Corporation's profits that much less. I do not think it has raised their selling price one particle. In other words, the 10 cents a ton has not been added to their selling price, and therefore the public has not paid it. It has come out of profits.

Mr. YOUNG. It is too small a matter to change the price.

The CHAIRMAN. I would suggest that Mr. Roberts finish his statement.

Mr. REED. Mr. Roberts was going to tell about the safety work to prevent accidents.

Mr. ROBERTS. I now have come to another topic, and that is "accident prevention."

While all companies were putting forth their efforts individually to prevent accidents, it was not taken up systematically by the corporation until 1906. In

March, 1908, a committee was appointed, known as the safety committee of the United States Steel Corporation, made up of six members—the general solicitor of the corporation, as chairman, and five other men representing five of the subsidiary companies. Later two additional members were added, making a total of seven of the larger companies represented on the committee.

This committee holds meetings periodically, going over matters pertaining to the best methods of preventing accidents, and acts as a clearing house in obtaining and disseminating information and suggestions tending toward the prevention of accidents and safeguarding employees.

This committee conducts inspections of the plants either as a body or by having an inspector from one company inspect another company's plants. It also studies serious accidents and makes recommendations as to how to avoid the occurrence of similar accidents.

Following the organization of the Steel Corporation safety committee the subsidiary companies organized committees whose functions are similar, with reference only to that company's plants. In addition, they have foremen committees and committees made up of the workmen themselves, who make regular inspections and suggest ways and means to prevent accidents. In addition to these committees, each company has its safety experts, who spend their entire time studying conditions of plants and how accidents are occurring, in an effort to still further safeguard our plants.

In the 18 months ending June 30, 1911, there was expended on this work $1,366,000, and there are still large appropriations for safety being granted. An appropriation was granted within the month amounting to $96,000, solely for safety and for one company.

The results of this safety campaign are that we have reduced our serious and fatal accidents 43.2 per cent since 1906. In other words, using the percentage for the normal pay roll of 200,000 employees shows that each year there now escape serious or fatal injuries over 2,300 men who would have been injured under conditions existing five years ago.

Attached hereto is a copy of bulletins Nos. 1 and 2, issued by the United States Steel Corporation safety committee, which explains to a fuller extent the workings of this committee. It also contains cuts of some of the devices approved by the committee. Hereto attached is also a copy of the survey, issue of November 4, 1911, and on page 1145 is an article entitled "Boosting for safety," written by John A. Fitch.

That is all I have on that subject.

Mr. REED. I would like to add, if the committee will permit me, that on this visit we hope you will make to some of the mills, you will see the effect of that policy in the protection of the men from dangerous machinery. It would be more marked if you could visit somebody else's mills at about the same time.

Mr. ROBERTS. We come next to the pension plan.

The United States Steel Corporation and Carnegie Pension Fund was established in the year 1910 by the joint action of the United States Steel Corporation and Andrew Carnegie. Its purpose is the payment to employees of old-age pensions from the income of the fund. For this purpose the United States Steel Corporation provided $8,000,000, which, with the Carnegie relief fund of $4,000,000, created by Andrew Carnegie on March 12, 1901, makes a joint fund of $12,000,000. This fund is administered by a board of 12 trustees through a manager appointed by the board.

Its principal features are:

(*a*) Compulsory retirement for men at 70 years of age and for women at 60 years of age after 20 years of service.

(*b*) Retirement at request of the employee or his employing officer at the age of 60 for men and at the age of 50 for women, after 20 years of service.

(*c*) Retirement by reason of permanent total incapacity, after 20 years of service for men under 60 years of age and for women under 50 years of age.

(*d*) Pension basis: For each year of service, 1 per cent of the average monthly earnings for the last 10 years of service.

(*e*) Credit for service rendered to any of the plants of the subsidiary companies of the United States Steel Corporation or to the predecessors of such companies.

In other words, a man may transfer from one subsidiary to another and still retain his years of service.

(*f*) Minimum pension, $12 per month; maximum pension, $100 per month. The operations of the plan for the year 1910 are as follows:

Total number of pensioners Dec. 31, 1911	1,606
Number of pensions granted during 1911	565
Total amount of pensions paid during 1911	$281,457.37
Average age at which pensions were granted ..... years	67
Average service of pensioners ..... do	30
Average pension granted	$20.75

In addition to the amount expended for pensions alone, other benefits from the fund were granted employees in the aggregate sum of $67,023, making the total cost of pensions and benefits from the fund $348,480.37.

The cost of administration amounted to $12,813.24, making the total disbursements of the fund $361,293.61.

The administration cost amounted to only 3.67 per cent of the disbursements.

Those benefits possibly Mr. Reed knows more about than I do. I do not understand what they mean there. Oh, I see. They were in connection with an old Carnegie plan.

Mr. REED. In addition to the figures Mr. Roberts has just given for the accident relief plan.

Mr. ROBERTS. That was part of an old Carnegie system.

The administration cost amounted to only 3.67 per cent of the disbursements.

Mr. BARTLETT. Recurring again to these safety appliances, I see you have signs up printed in four different languages other than the English language.

Mr. ROBERTS. Yes.

Mr. BARTLETT. Can you tell what languages they were?

Mr. ROBERTS. I think they are largely Hungarian dialects. Some of these Hungarians can not understand each other, I think.

Mr. BARTLETT. There are four different signs here.

Mr. ROBERTS. I think probably they are the different dialects of the Hungarian. In Budapest, for instance, the printed signs at the shops are not in letters. They paint on the signs what they sell, because the residents in even Budapest can not read the languages; there are so many of them.

Mr. BARTLETT. Have you any idea how many, amongst your employees, are illiterate and can read no kind of written signs?

Mr. ROBERTS. I testified this morning that at the Pencoyd Iron Works the English-speaking people amounted to some 80 per cent.

Mr. BARTLETT. That is an exception to the rule, is it not?

Mr. ROBERTS. No; I do not think so. There may be some cases where you have larger percentages than this, but it is a fairly average case.

The CHAIRMAN. Take the figures you have given us about those miners.

Mr. YOUNG. Those are nationalities, not whether they can speak the English language or not.

Mr. REED. There is a system of symbols adopted for those men who can not read. Mr. Close tells me they have the red ball, which is known all through the mills as the danger sign, just like the red cross is the symbol for charity work.

Mr. ROBERTS. That pension system is in its infancy. Whether it will permanently be continued on those lines or changes made I am not prepared to say. My own personal feeling is that we want to get away from any idea whatsoever of charity connected with anything like a pension system. It is a right, not a gift, and how that shall be gotten at or brought about is an important matter. For instance, the pension system of the Pennsylvania Railroad has been working now for some years and working very successfully. Everyone who enters that service feels that he is entitled to it, that it belongs to him when he reaches the time he should get it.

There is one thing in a pension system that is a hardship—in a good many pension systems—namely, if a man becomes incapacitated prior to having worked the required number of years, he does not participate in the pension. I was only speaking of that the other day in regard to the pension system of the Pennsylvania Railroad. A man must be in its employ a certain number of years before he can obtain his pension. If he is incapacitated through no fault of his own prior to that time, he does not participate in the pension. On the other hand, the railroad in that case contributes to his support. It is practically the same as if he had gotten into the pension, but it makes it appear as if there was a charity element, which I do not like personally.

The CHAIRMAN. For instance, I have here the number and the per cent of foreign-born employees of the Oliver Iron Mining Co. who speak English, May 1, 1907, by race or people.

Mr. STERLING. That is the per cent of foreign born. As I understand it Mr. Roberts gives the per cent of the whole number of men.

Mr. ROBERTS. The whole number of employees.

Mr. STERLING. Do these men contribute anything to the pension fund?

Mr. ROBERTS. The men contribute nothing.

Mr. YOUNG. What percentage is given of those who speak the English language?

The CHAIRMAN. Austrian, 244; 30 per cent.

Mr. YOUNG. That speak English?

The CHAIRMAN. Yes; that speak English. That do not speak English, 570.

Bohemian, 25, 51 per cent, speak English; 24 do not speak English.

Bosnian, 29, 19.9 per cent, speak English; 117 do not speak English.

Bulgarian, 24, 11.4 per cent, speak English; 186 do not speak English.

Mr. YOUNG. These are total employees of those nationalities?

The CHAIRMAN. The total per cent of foreign-born employees of the Oliver Iron Mining Co. who speak English.

Mr. YOUNG. I understand, but——

The CHAIRMAN (interposing). This company had 12,478 employees on July 1, 1908. The Americans were 25.8 per cent of this number. The rest were foreigners. Of these foreigners, of the 75 per cent of all the 12,000 employees——

Mr. YOUNG (interposing). I was noticing as you read that the numbers of men were very small in the nationalities that you mentioned.

The CHAIRMAN. But there is a list of them here a yard long. Of the Croatians 580 speak English and 1,310 do not. Of the Finnish

1,372 speak English and 1,151 do not. Of the Italians there are three lists. Of one set 146 speak English and 89 do not; of the Italians (north) 164 speak English and 134 do not; of the Italians (south) 257 speak English and 238 do not.

Then here is the Magyar race; 72 speak English and 138 do not. Of the Montenegrin 28 speak English and 74 do not. Of the Slav people 71 speak English and 120 do not. Of the Slovaks 145 Speak English and 214 do not.

Mr. YOUNG. Does it give any Swedes and Norwegians?

The CHAIRMAN. There are French, German—all the races. The totals are here. Out of a total of 10,114, 5,197 do not speak English in that one company, the Oliver Iron Mining Co., who work altogether about 13,000 men.

Mr. YOUNG. I should very much doubt that statement, from my own experience.

The CHAIRMAN. Only 10 per cent of the employees in this table can speak English.

I have been quoting you from Labor Bulletin No. 84, published in September, 1909. This report is prepared by Frederick S. Crum, Ph. D.

Mr. GARDNER. Read the heading of the table.

The CHAIRMAN (reading). "Number and per cent of foreign-born employees of the Oliver Iron Mining Co. who speak English, May 1, 1907, by race or people."

Mr. GARDNER. That is, of all the foreign born about half speak English and half do not.

The CHAIRMAN. No; of the total number given about half speak English. Of the foreign born only 5,197 speak English, out of a total of 10,114.

Mr. GARDNER. Yes; I was correct in my statement that about half speak English and half do not.

The CHAIRMAN. Yes. I read the other portion of it, Mr. Gardner. I will go over it again. I want to be absolutely just. Out of 12,478 employees in this company on July 1, 1908, the Americans were 25.8 per cent of this number. I read this before.

Mr. GARDNER. It is just about that way. One-half of the foreigners speak English and one-half of the foreigners do not. And out of the whole number of employees 9 out of every 21 can not speak English.

The CHAIRMAN. He also gave us the figure here that 20 per cent of all the people employed in the mine were native born. Now, he gives us the Pencoyd Iron Works, which shows an entirely different condition.

I do not doubt for an instant the accuracy of Mr. Roberts's statement; but we also have reports from very disinterested parties, like Prof. Perdue and Mr. Neill, of the Bureau of Labor; and I will say, from my personal acquaintance with Mr. Neill and as a result of the many conferences I have had with him, I have been impressed with the fairness and conservatism of the Commissioner of Labor.

Mr. ROBERTS. Of course, Mr. Chairman, in stating the law of averages, they are made up of a number of individual instances. That is, as I understand, an average result. Although you would not find probably that same percentage to prevail among all the different operations of the Oliver Iron Mining Co., neither would you find the

same percentage prevails among all the individual plants of the subsidiary manufacturing companies of the Steel Corporation; but there would be an average—some might be more, some might be less.

The CHAIRMAN. This report takes in all the employees of the Oliver Mining Co.

Mr. ROBERTS. True; but it is an average of all of them as of some one particular day.

The CHAIRMAN. Yes.

Mr. ROBERTS. I do not know, unless I had information, as to how those statistics were made. I would want to know whether a census had been made on some one particular day, as to whether all those employees spoke English or did not speak English. Some of those statistics may be made up from records made by the company at the time a man was employed, and would not hold good six months or a year after that, because in the meantime the man might learn sufficient English to talk it.

The CHAIRMAN. This is made of date May 1, 1907.

Mr. ROBERTS. But was it made by actual solicitation of those employees to determine whether each one spoke English or not?

The CHAIRMAN. I do not know.

Mr. ROBERTS. As I said yesterday, statistics sometimes prove to be like a loaded gun.

The CHAIRMAN. I do not mean to testify, but I was up there; I have mixed around those people, and apparently to me, from the noise and rattle, it was a gibberish and babel of every language under the sun except the English language. It was the exception that we found one of those men, unless he were a skilled laborer, who could talk the English language at all.

Mr. REED. That explains some of the chairman's misinformation.

The CHAIRMAN. All that the majority of those I saw could say was, "Nicht versteh."

Mr. ROBERTS. Undigested foreigners are as dangerous as undigested securities. I think it is a problem which this country has got to face before very long.

The CHAIRMAN. What I am getting at is this, that the Pencoyd Iron Works appear to be an exception in the number of the American-born employees.

Mr. ROBERTS. Not American born, but English-speaking. That was without reference to birth.

The CHAIRMAN. If American born, they are bound to speak the English language.

Mr. YOUNG. Some people that are born abroad speak English.

Mr. ROBERTS. You mean the American language?

The CHAIRMAN. Mr. Fitch gave a table here for the whole Carnegie Co. Your Pencoyd Iron Works employ only a few thousand men?

Mr. ROBERTS. That is all.

The CHAIRMAN. Is not that a finishing mill?

Mr. ROBERTS. No. It is an open-hearth steel plant, making open-hearth steel, and rolling mills making structural shapes.

The CHAIRMAN. It has been in operation a long time?

Mr. ROBERTS. Yes; since 1852.

The CHAIRMAN. Is it not true that your newest mills always have a greater per cent of foreign employees?

Mr. ROBERTS. No; not necessarily.

The CHAIRMAN. If you were to start an iron mill in my country, for instance, unless you imported your employees every man would speak the English language, because 95 per cent probably of the people down there are American born.

Mr. ROBERTS. And as soon as you started that those Americans would take all the best jobs, and would not want the others.

The CHAIRMAN. They would if you would pay them enough.

Mr. ROBERTS. There would not be enough there to go around. No; I do not think that follows. I think it depends somewhat upon the location. You get into a new country and you find an increased number of foreign born among the population. On the other hand, when you come to New York, which is a port of entry, you find a very large foreign population there.

Mr. GARDNER. You do not know how these statistics were made up?

Mr. ROBERTS. I do not; no.

Mr. GARDNER. But you think very likely they were made up from your books?

Mr. ROBERTS. Which statistics are these?

Mr. GARDNER. That the chairman has been reading.

Mr. ROBERTS. Oh, I do not know how they were made up.

The CHAIRMAN. I will try and get this man here if you want him.

Mr. GARDNER. I guess it is rather branching off from the main thing, anyway.

As I understand your position, you think perhaps they were made up from the cards showing whether these men could speak English when they came into your employ?

Mr. ROBERTS. That was my idea, as against a direct solicitation as of a certain day, to see whether they spoke English or not.

Mr. GARDNER. So far as you know, there was no census made of a sample occupation, for instance, and that multiplied by the total number of employees? You do not know, for instance, whether this gentleman made an actual census of a part of your employees and then assumed that proportion would hold good through them all?

Mr. ROBERTS. No; I have no knowledge whatever as to any data in regard to it.

Mr. GARDNER. As a matter of fact, if you took one department of your works and took a census of that, as to ability to speak English, would that be a fair sample of the whole?

Mr. ROBERTS. Not at all. Each individual department would have to be treated individually.

Mr. GARDNER. That is to say, the degree of skill is so different?

Mr. ROBERTS. Yes; it would depend upon the nature of the occupation.

Mr. GARDNER. In some higher-skilled occupations you would expect to find a greater proportion who spoke English?

Mr. ROBERTS. If you took our machinists, they probably would all speak English.

Mr. GARDNER. Is there such a thing as an average shop?

Mr. ROBERTS. No; they are only average results. Each shop is an individual activity in itself.

Mr. STERLING. When the steel company need men, do they advertise for men?

Mr. ROBERTS. I should think that would differ very much in each individual works. As a rule they do not advertise for men. Men seek the employment.

Mr. STERLING. Do you know whether they go to employment agencies to get men?

Mr. ROBERTS. I think possibly on certain occasions they may notify employment agencies that they are in need of workmen.

Mr. STERLING. Do you say you prefer men of any particular nationality?

Mr. ROBERTS. I never heard of it. My own experience has been in the time prior to 1900 that we rarely, if ever, sent to an employment agency. I do not believe we ever did. Men know where the work is apt to be obtained, and they seek it. They apply. We had a small building which was known as an application office. You would find men coming to that application office regularly twice a day, when the turns commenced, applying for work.

Mr. STERLING. A sort of employment agency?

Mr. ROBERTS. I would not term it an employment agency, but it was an office where men made application when they wanted work.

The CHAIRMAN. Did you keep a list there of objectionable men?

Mr. ROBERTS. None whatever.

Mr. STERLING. When the strike came on in 1909 I believe you were connected with it at that time, were you not?

Mr. ROBERTS. I became a director in the fall of 1909.

Mr. STERLING. Did the company, so far as you know, or any of the authorities of the company advertise or authorize an advertisement for men of Hungarian and Polish birth?

Mr. REED. Syrians and Roumanians.

The CHAIRMAN. Poles preferred.

Mr. ROBERTS. No action was ever taken by the Steel Corporation in that matter, and to my knowledge it was never mentioned; and I would say that I have been pretty regular in attendance on the meetings.

Mr. STERLING. Do you know, as a matter of fact, whether the men who have authority to hire—the officials of the company who have authority to hire—prefer men of those nationalities for work in the Steel Corporation or any part of the works?

Mr. ROBERTS. I should say to the contrary. I have no question in my mind in the world but that any foreman or superintendent in any subsidiary company of the United States Steel Corporation, or in any other steel works, would take at any time an English-speaking man in preference to one who did not speak English.

But as to nationalities of that kind, there is no preference. I think there is, for instance, the Polander, who is an extremely good, steady man as a rule, better than some of those who come from southern Russia, I think. It is just judging from my own experience. I can not locate them geographically exactly, but there is among some of those races more sturdiness, rather stronger men than others. Possibly it has occurred from previous employment. Some have been accustomed to agriculture, I think.

Mr. STERLING. Mr. Chairman, where is that advertisement that was exhibited the other day?

The CHAIRMAN. I will get it for you.

Mr. STERLING. I will show you an advertisement that was exhibited here the other day with reference to the employment of men and ask you if you know anything about it.

Mr. BARTLETT. While we are waiting for that I want to ask in reregard to pensions. Among these rules I notice the following:

An employee placed upon the pension list must retire from and can not reenter the service, but may engage in other business so long as such other business is not of the same character as his former employment.

A man that is 60 years of age, if he has been in the employment of the company 20 years, retires and receives a pension, as provided here, of not more than $100 nor less than $12 a month. But the provision here is if he is placed on the pension roll he can not reenter your service, but he may engage in other business so long as such other business is not of the same character as his former employment.

Mr. ROBERTS. That 60-year age pension is a voluntary retirement on the part of the men. It is not compulsory.

Mr. BARTLETT. I understand that.

Mr. ROBERTS. But I presume that is a protection, for instance——

Mr BARTLETT (interposing). I merely use 60-years as an illustration.

Mr. ROBERTS. It might be a superintendent. He might have knowledge which we would not want him to use by entering the employ of a competitor. I can imagine such a case as that.

Mr. BARTLETT. Yes; but it does not say that.

Mr. ROBERTS. It does not say that, but it simply provides that he shall not enter a similar employment.

Mr. BARTLETT. Not that a man could not be employed in any steel mill?

Mr. ROBERTS. In other words, take a distinct illustration. If the Carnegie Steel Co. has a superintendent, or some one who has knowledge of trade matters, that they would not want divulged to a competitor, it would prevent him from entering the employ of Jones & Laughlin, for instance, while he was on the pension list. There is nothing to prevent him leaving the employ of the Steel Corporation at 60.

Mr. BARTLETT. But, if he accepts a pension, he can not reenter your employment?

Mr. ROBERTS. Yes; he can do anything except to enter a similar employment.

Mr. BARTLETT. No. It says he can not reenter your service, and must retire.

Mr. ROBERTS. As long as he takes the pension. If he gives up his pension he can reenter the employment.

Mr. BARTLETT. No; it does not say so. I will read it again:

An employee placed upon the pension list must retire from, and can not reenter the service, but may engage in other business so long as such other business is not of the same character as his former employment.

Mr. ROBERTS. But I understand "who is placed upon the pension list"——

Mr. GARDNER (interposing). It seems to me that is a perfectly plain provision, that a man should not take advantage of a voluntary pension at 60 years of age, because he doubtless will take it.

Mr. BARTLETT. I did not fix it at 60. That is a mere illustration.

Mr. GARDNER. If he is able to render service he ought not to be pensioned until he gets ready to say he is no longer able to continue.

Mr. BARTLETT. But the rule provides that he can be pensioned at 60.

Mr. GARDNER. Certainly. It seems to me the obvious result of not having such a rule would be that when a man became 60 years of age he would take a pension from the United States Steel Corporation and go to work for somebody else.

The CHAIRMAN. By the way, gentlemen, I have had Mr. Eagle here for two days. We can get thorugh with him in five minutes.

Mr. REED. Mr. Roberts is almost through.

Mr. ROBERTS. Three minutes will finish me.

Mr. STERLING. Before you go, Mr. Roberts, here is an advertisement of the Pittsburgh Gazette-Times of Thursday, July 15, 1909, which is the advertisement I mentioned a few minutes ago [handing same to the witness].

Mr. ROBERTS. Do I understand that is alleged to be an advertisement of the United States Steel Corporation?

Mr. STERLING. Yes.

Mr. ROBERTS. To the best of my knowledge it was not.

The CHAIRMAN. The officer of the American Sheet & Tin Plate Co., who testified a few days ago, said he had inserted it.

Mr. REED. If I may be permitted to explain to the witness, it has been testified by one of the officers of the American Sheet & Tin Plate Co. that they retained an employment agency to obtain men for them during the tin-plate strike of 1909.

Mr. ROBERTS. But that is the advertisement of the employment agency.

Mr. REED. And that employment agency put that advertisement in the papers after it had been stated by the tin-plate officers to the employment agency that if Americans were not available they would prefer that class of foreigners to others.

Mr. STERLING. I did not hear that testimony or I would not have taken the time to put that question. Who was he?

Mr. REED. Mr. Irvin.

Mr. DANFORTH. Before Mr. Roberts finishes, I would like to ask him a few questions.

We have had several witnesses before us who complained in rather unmeasured terms against this pension system of the corporation. They said it was un-American that any pension system should incorporate in its terms the raising of a certain portion of the pension from the men who would be subsequently pensioned. What do you say in regard to that?

Mr. ROBERTS. I should think that was a question that was open to discussion. I do not consider this system has arrived at perfection at all. But I do believe it is better, for instance, than if we took the other extreme of the United States Government and provided nothing whatever for its employees in their old age. I think it is a step in the right direction.

I am opposed, however, to any aspect of it that may have any tendency to look like a charitable institution. I think the employee should feel that after those years of service he has something to

which he is entitled, just the same as an officer in the Army or Navy looks to retirement at a certain age, on a pension, as part of the system which belongs to him. He does not contribute to it. But at the same time no one for a moment will say that an officer retired is a subject of charity.

Mr. DANFORTH. One witness, who perhaps was a theorist, because he did not claim to know the facts in regard to what he was telling us, said that this was un-American, that it tied the men down. It seemed to him it was for the purpose of retaining the men in the service and not leaving them free agents.

I think I have made a fair statement of that. One of the members of the committee suggests to me he described it as a species of slavery; that the purpose was not a friendly one, but it was to tie up the employees to service with the corporation.

What have you to say in regard to that?

Mr. ROBERTS. As I said before this morning, I believe where men feel that their condition is bettered it necessarily follows, as night does day, that it is to their interest to remain where they can do better than elsewhere. Therefore, while they are perfectly free agents to come and go as they please, the contrary to that proposition would be to have a policy whereby the longer they were in your employ the greater their desire to leave it. That certainly would not be a sensible policy in any shape or form.

I think a pension plan does aid in making loyalty among employees to the corporation which employs them. It is a system which we have in operation on the Pennsylvania Railroad and have had for some years. It has worked extremely well there. The employees of the Pennsylvania Railroad all feel that after a certain term of service they receive this pension.

Now, whether it is better to have the men provide a portion of that is a matter of which I think much can be said on both sides, possibly. I am not prepared to pass an opinion; I have not thought enough of it. But I do think this pension system is a step in the right direction. I do not consider, by any means, that it is in a final form. All these things are more or less tentative and they will be probably changed. But, at the same time, I am not prepared to say at all that it is the proper policy for the men to contribute. There are other means by which, if they wish to use a portion of their wages, they can provide annuities, and so on, through other channels.

But, again, if that provision is voluntary, you know what human nature is. Some are improvident. They do not look forward to old age. They say, "We will be happy while we may," and let it slip by. If, by compulsion, you take it from their wages, you are practically reducing their wages.

Mr. DANFORTH. Do you think at the present stage of the pension system, in your corporation, the employees would look with favor upon the retention of any portion of their wages for pension, even if they were given a contract right to the pension?

Mr. ROBERTS. No; I do not think they would. I do not think they would be willing to accept any such condition.

Mr. DANFORTH. You think it would create a disturbance in the operation of a corporation?

Mr. ROBERTS. I absolutely do.

Mr. DANFORTH. There is a clause here which has been commented upon. I read one of your rules:

A pension may be withheld or terminated in case of misconduct on the part of the beneficiary or for other cause sufficient, in the judgment of the board, to warrant such action.

Other witnesses have commented upon that as a convenient loophole of depriving men, after long years of service, of the benefits of your system.

Mr. ROBERTS. I understand that applies to some one who is on the pension list. It does not apply to misconduct prior to the receipt of the pension, but to misconduct during the receipt of the pension, does it not?

Mr. DANFORTH. Well, I do not know.

Mr. ROBERTS. No such case has come before me, and I think those cases are referred to the financial committee of the Steel Corporation. I believe it is the final arbiter.

Mr. DANFORTH. It may come down to the finance committee eventually.

Mr. REED. As a matter of fact, a great many pensioners are men who have been out on strike against the company.

Mr. ROBERTS. There is no doubt about that.

Mr. DANFORTH. These witnesses were referring to this rule in that connection.

Mr. ROBERTS. I do not think that applies to any misconduct prior to the receipt of the pension. I think it possibly might be, if some misconduct occurred during the receipt of the pension, that then it is within the power of the company to withdraw it.

Mr. DANFORTH. As you understand it, that particular clause does not refer to a man or woman receiving a pension after the proper length of service which would justify the giving of a pension to such person?

Mr. ROBERTS. It does not refer to any misconduct prior to that time; no.

Mr. DANFORTH. And has not anything to do with the operation of the other pension rules in regard to the age at which they can obtain them. It is automatic.

Mr. ROBERTS. In one case it is voluntary and in the other case it is compulsory.

Mr. DANFORTH. And at those specified ages, at classes 1 and 2, they can go on the pension list?

Mr. ROBERTS. Exactly.

Mr. DANFORTH. Automatically?

Mr. ROBERTS. Exactly.

Mr. DANFORTH. Or, in No. 1, automatically?

Mr. ROBERTS. Exactly. I think some of those clauses are safeguards which have been put in, feeling our way to a certain extent. It is a new system. It was desired to hold a certain amount of control over it until we saw how it developed.

I know of no cases of the kind to which those rules are applicable.

Mr. DANFORTH. How long has this pension system been working in the corporation?

Mr. ROBERTS. Only since January 1, 1911, I think.

The CHAIRMAN. Mr. Roberts, I caught from one of your answers that you were under the impression the Interstate Commerce Commission had some control over wages paid men engaged in the service of common carriers of the Steel Corporation and of others.

Mr. ROBERTS. You say I said so?

The CHAIRMAN. That was the way I caught it.

Mr. ROBERTS. No; I did not intend to give that impression at all.

Mr. REED. You mean as to hours of service?

Mr. ROBERTS. I said that our transportation companies were very similar in their operation to all other common carriers and subject to their rules and regulations.

The CHAIRMAN. Do you not keep data as to the wages paid those men, their nationalities, etc., like you do as to other employees of whom you have spoken?

Mr. ROBERTS. I can not answer that for the railways. I do not know. I have not investigated those matters.

The CHAIRMAN. Will you be good enough to furnish this committee with a statement of the number of employees on the Duluth, Missabe & Northern and the Duluth & Iron Range. I mean, employed in the operation of the road. I do not mean in the construction. I mean like firemen, engineers, brakemen, and conductors. I would like to have the wages paid these men and their nationalities, if you have that information.

Mr. ROBERTS. I doubt if we have their nationalities. I am sure they are all English speaking. I can be sure of that.

Mr. REED. If we can get that information we will give it to the chairman.

The CHAIRMAN. You will get that?

Mr. REED. We will try to get it.

The CHAIRMAN. It might be gotten from the Interstate Commerce Commission, but I doubt it. Since this information has gone into the record I am very anxious to get this other in also.

Mr. REED. If it is available the committee will get it.

The CHAIRMAN. I presume you would not keep these carefully tabulated statements as to other employees and not keep the same information as to railroad employees?

Mr. REED. I presume not.

The CHAIRMAN. I would like to have it, not only as to the Duluth, Missabe & Northern and the Duluth & Iron Range, but also the Bessemer & Lake Erie and the Elgin, Joliet & Eastern.

Mr. REED. Mr. Roberts has one thing more, and then he is through.

Mr. DANFORTH. Have you put into the record the data in regard to ore miners or employees in the northwest?

Mr. ROBERTS. Which data is that?

Mr. DANFORTH. Have you put into the record the data in regard to ore miners or employees in the northwest?

Mr. ROBERTS. What data is that?

Mr. DANFORTH. Similar to those employees you have already referred to.

Mr. ROBERTS. I put in a report from the president of the Oliver Iron Mining Co., which I did not read yesterday. It was among the data which I put in yesterday. I presume it has gone into the record.

I have only one subject more, and that is the profit-sharing plan. I have here a letter addressed to me under date of February 10, 1912, from Mr. Richard Trimble, secretary, which reads:

At Mr. Bolling's suggestion I am sending you the original employee stock-subscription circular and the offer to officers and employees for 1912.

In response to this year's offer we have to date received subscriptions from 36,939 subscribers for 61,389 shares, divided as follows:

	Shares.
Subscriptions from employees receiving salaries of $800 per annum and under, 15,304, for	17,223
Subscriptions from employees receiving salaries from $800 to $2,500 per annum, 20,051, for	35,238
Subscriptions from employees receiving over $2,500 per annum, 1,584, for	8,879

The above is not quite complete, as subscriptions from employees of the steamship company are not sent in until the opening of navigation, but when complete will show an increase over last year's subscription of about 50 per cent.

I submit herewith a circular addressed to the officers and employees of the United States Steel Corporation and of its subsidiary companies, under date of December 31, 1902, in regard to this subject. Also a circular addressed to the officers and employees of the United States Steel Corporation and of its subsidiary companies, under date of January 2, 1912.

The CHAIRMAN. Do any of those contain the resolution providing for profit sharing among the officers where the returns are above so much per annum, where the profits are above so much per annum?

Mr. ROBERTS. I do not think I understand what you mean.

The CHAIRMAN. You have a resolution somewhere to the effect that if your profits are over so many millions per year, then a certain per cent, 2 or 3 per cent I believe it was, is to be divided among the officers of this concern, to be determined by the executive committee.

Mr. ROBERTS. That is another matter entirely.

The CHAIRMAN. That is not in?

Mr. ROBERTS. No. That has nothing to do with the stock subscription.

Mr. GARDNER. Have you that resolution in evidence?

Mr. REED. It is part of the minutes of the Steel Corporation which they have submitted time and time again. I imagine the chairman has a copy of it.

Mr. GARDNER. It is not in the record?

Mr. REED. It is not in the record.

Mr. GARDNER. I never heard of it before.

The CHAIRMAN. There is such a quantity of those minutes. I asked Mr. McRae if he had it, and I think he said he did.

Will you furnish a copy of that resolution, Mr. Reed?

Mr. REED. Yes, sir; we will obtain it.

Mr. ROBERTS. Now, Mr. Chairman, I believe I have finished. I would only like to say one word, and that is that in all I have said here I want to put myself finally upon record that I am at all times willing to be in the front rank in any work which is done to improve conditions of the employees, but I will not lend my aid to holding out any glittering hopes, I might say, which in the end will not be realized and can not be realized.

I have been among workmen for a great many years. I have now a voluntary testimonial from over 3,000 men with whom I was a fellow workman for more than 25 years, and I am perfectly willing to let that speak for itself so far as my position is concerned.

I do believe that the solution of these problems will be one of evolution rather than revolution. You can not change this industrial system in a day or a night, or 10 years. I believe what I have set before you here has gone very far toward solving a number of the problems which have confronted us in the past.

I am extremely indebted for your great patience. If I can answer any questions I will be very glad to do so.

The CHAIRMAN. We are very much indebted to you. I feel I can speak, I know for the chairman, and possibly for the committee, when I assure you I do not know of any disposition on the part of this committee toward revolutionary remedies.

Mr. ROBERTS. I did not mean for a moment to apply that to the committee. I was speaking of some solutions which are popular at the present time.

The CHAIRMAN. We understood. We are very grateful to you, Mr. Roberts; you have been very kind.

STATEMENT OF H. H. EAGLE.

The witness was duly sworn by the chairman.

The CHAIRMAN. Mr. Eagle, I desire to state that Mr. Seldes was on the stand here some few days ago and made a statement with reference to a list of objectionable employees of the Steel Corporation. I knew little about this list. I had heard that there was such a list in existence and asked him about it. I presumed he was speaking about an actual list and knew he would dislike to give the name of his informant.

It was very properly suggested, however, by certain members of the committee that, having stated there was a list which was apparently a black list in existence, it was due to the United States Steel Corporation that he should give the name of his informant. After consideration of the matter I came to the conclusion that the gentlemen asking for the information were right. The chairman, in his hesitancy to ask this man to answer, notwithstanding the fact that the information was given to him in confidence, thinks his position was well taken.

Under the peremptory order of this committee he was forced to tell the name of his informant. He said that you had spoken to him of this list, which was in your possession, although not your property at that time. I was then directed by this committee to issue a subpœna duces tecum for you.

I advised you immediately that unless you appeared before this committee I would be forced to exercise such authority as was vested in me by the House of Representatives to force you to appear before this committee and to produce the list.

Now, I want to know if you have that list in your possession, and if Mr. Seldes was correct.

Mr. EAGLE. I have what purports to be a copy of that list.

Mr. REED. May I glance at it?

(The witness handed counsel the paper as requested.)

The CHAIRMAN. Do you know from whence that list was obtained?

Mr. REED. You are asking him of his own knowledge?

The CHAIRMAN. Yes.

Mr. EAGLE. A man named Thomas Morgan, formerly employed as labor agent by the Carnegie Steel Co., brought that copy and the original, or what he said was the original, in a book to the Pittsburgh Leader for the purpose of selling it to us. He brought it to Managing Editor Emge and Mr. Moore, the editor in chief. I was there at the time.

The CHAIRMAN. Did you see the book?

Mr. EAGLE. I saw the book.

The CHAIRMAN. What was in this book? Did you compare the book with the list?

Mr. EAGLE. No; I did not.

The CHAIRMAN. Did you see the entries in the book?

Mr. EAGLE. No; I did not. I saw something in the book.

The CHAIRMAN. What did the book contain, from what you remember?

Mr. EAGLE. I could not say that. Mr. Morgan, however, said this was a copy, and I presume it was, inasmuch as he was trying to sell it to us; and this was what I had to work on.

The CHAIRMAN. Did you ever go to see any of these men whose names were on the list?

Mr. EAGLE. Not personally. I assigned other men to do it.

The CHAIRMAN. Did they go to see these men?

Mr. EAGLE. The list is so old that most of the men have left town, gone away, or died.

The CHAIRMAN. At the time did you send men to see them?

Mr. EAGLE. I did.

The CHAIRMAN. Did you find they were ex-employees of the company?

Mr. EAGLE. One or two.

The CHAIRMAN. Who had been discharged and could not secure employment thereafter?

Mr. EAGLE. No; they had not been discharged. They had left of their own volition in each instance. I think there were two. As I say, the list was very old, and it was difficult to get in touch with anybody on it.

Mr. GARDNER. You mean the list was very old at that time, or is very old now?

Mr. EAGLE. It was very old at that time; it is a year and a half older now.

Mr. REED. The dates, I notice, run back to 1898, apparently.

Mr. GARDNER. What is a recent date?

Mr. REED. Here is a date of September 4, 1903. It is all on the same kind of paper, but with different typewriters, apparently.

Mr. DANFORTH. Did you have this list made from the original?

Mr. EAGLE. No.

Mr. DANFORTH. Did you compare it with the original?

Mr. EAGLE. No.

The CHAIRMAN. Do you know where Mr. Morgan is now?

Mr. EAGLE. I do not.

The CHAIRMAN. What was Mr. Morgan's business?

Mr. EAGLE. He said he was a labor agent, whatever that is.
Mr. REED. Do you know yourself?
Mr. EAGLE. No.
The CHAIRMAN. Do you know whether or not you have a man in your employ as labor agent of the Carnegie Steel Co.?
Mr. REED. There was a man named Morgan employed by the assistant to the president—I think it was, of the Carnegie Co.—up until about 1905 or 1906.
The CHAIRMAN. As a labor agent?
Mr. REED. As a clerk.
Mr. STERLING. Did you buy the list?
Mr. EAGLE. No.
The CHAIRMAN. What was the address of Thomas Morgan at the time he gave you this list?
Mr. EAGLE. The Iroquois Apartment, Pittsburgh—on Forbes Street.
The CHAIRMAN. What do you mean by Iroquois?
Mr. EAGLE. That is the name of the apartment house, an apartment house on Forbes Street.
The CHAIRMAN. Did you buy the list?
Mr. EAGLE. No. That is the reason for my reluctance in presenting it here. It is not my property, nor the property of the Pittsburgh Leader.
Mr. STERLING. Did he finally give it to you without pay?
Mr. EAGLE. No. He took his book. I do not know whether the proposition was ever definitely and finally refused or not. He took the matter up with our editor and managing editor, and this list was kept in their possession. He never came back. He dropped out of sight, and I don't know where he is.
Mr. STERLING. The book you speak of, as I understand you, contained the original list?
Mr. EAGLE. Yes.
Mr. STERLING. From which he said this list was made?
Mr. EAGLE. Yes.
Mr. STERLING. Did you see the book itself?
Mr. EAGLE. I saw it, but I did not scrutinize it very carefully.
Mr. STERLING. You never compared it with this?
Mr. EAGLE. No.
Mr. STERLING. Who did he talk to in connection with this paper, besides you?
Mr. EAGLE. He talked to the editor in chief, Mr. Moore.
Mr. STERLING. Do you know whether he compared it?
Mr. EAGLE. I am pretty certain he did not. Also he talked with Mr. Emge, the managing editor.
Mr. STERLING. Why did he think your paper wanted to buy it?
Mr. EAGLE. He was not trying to sell it to us alone. It was a syndicate proposition. That is to say, he wanted a string of papers to take the list and print it.
Mr. STERLING. What did he say about the list?
Mr. EAGLE. He said it was a black list, and it could be confirmed as such. He seemed to think it was of news value because of that.
Mr. GARDNER. Did he say that each of the companies had one of these books, such as he was trying to dispose of?

Mr. EAGLE. Yes; I believe the superintendent of each company, or of each mill, had one, as he explained it.

Mr. GARDNER. And each one of them held a duplicate of this?

Mr. EAGLE. Yes.

Mr. GARDNER. Who did you say prepared the copy?

Mr. EAGLE. I can not answer that. I do not know.

Mr. GARDNER. Was that one of the copies which he prepared himself to show you—a sample of his goods—or was it something that he alleged to have gotten from one of the subsidiary companies?

Mr. EAGLE. I do not believe he ever made any direct statement on that subject. But he left me under the impression this was a copy of the book, and that from this copy could be secured the names of men who could be looked up.

Mr. GARDNER. What was his object in giving you a copy?

Mr. EAGLE. I guess he did not want the book—the original—to get out of his possession.

Mr. GARDNER. What price did he ask for the original?

Mr. EAGLE. I do not know. Something like $5,000, I believe, although I am not certain.

Mr. GARDNER. Did he state where he got the original?

Mr. EAGLE. No; I did not hear him.

Mr. GARDNER. Had he been assistant to the president of the Carnegie Co.?

Mr. EAGLE. I can not answer that; I do not know.

Mr. GARDNER. You did not know anything about him?

Mr. EAGLE. I did not. Mr. Moore may have.

Mr. REED. Excuse me, Mr. Gardner. I did not say there had ever been an assistant to the president named Morgan. There was a clerk in the office of the assistant named Morgan.

Mr. GARDNER. Was his name Thomas Morgan, do you remember?

Mr. REED. I believe so.

The CHAIRMAN. Do you know where he is now?

Mr. REED. No.

Mr. GARDNER. Do you know, Mr. Eagle, where Thomas Morgan is now?

Mr. EAGLE. I do not.

Mr. GARDNER. When did you hear of him last?

Mr. EAGLE. I should say 18 months ago.

Mr. GARDNER. Was he living in Pittsburgh then?

Mr. EAGLE. Yes.

Mr. GARDNER. Do you think he is living in Pittsburgh now?

Mr. EAGLE. I could not say that, because I do not know.

Mr. GARDNER. There has been no further negotiation regarding this book since two years ago, is that it?

Mr. EAGLE. Approximately. It has been lying in my desk for probably that long.

Mr. STERLING. Was he then in the employ of the company at that time?

Mr. EAGLE. I believe he was not; no.

Mr. STERLING. Did you understand he had stolen this book from the company when he left its employ, or at some other time? Taken it without their consent?

Mr. EAGLE. Well, I do not know that. I believe I did hear somebody say he had stolen it, but I do not think he said he had stolen it.

Mr. GARDNER. I am not able to get this through my head. Here is a list which runs away back before the formation of the United States Steel Corporation, and yet, according to this man, it was a list shuffled around among the various subsidiary companies, when the list itself shows that there were no such things as subsidiary companies at the time.

That list is apparently of blacklisted men, or the greater part of it, whether blacklisted for cause or otherwise, before the formation of the United States Steel Corporation. According to the statement that was made here, this is a list which was used among the subsidiaries of the Steel Corporation.

Now, was that prepared in 1901, 10 or 15 years after the men had been discharged? Did you not say 1888, Mr. Reed?

Mr. REED. 1898 was the earliest date I noticed.

Mr. GARDNER. Three years after the men had been discharged. Was that your understanding?

Mr. EAGLE. I did not have an understanding on that phase of it at all.

Mr. STERLING. You had charge of the matter and sent out some messengers to interview some of these men?

Mr. EAGLE. I sent out reporters.

Mr. STERLING. And found two of them?

Mr. EAGLE. Two, I believe.

Mr. STERLING. And no more?

Mr. EAGLE. I could not answer that. There were two that I remember, notes concerning whom I found with the list when this matter first came out, after I had dug it out of the débris on my desk.

Mr. YOUNG. They were men you say had quit?

Mr. EAGLE. Yes.

Mr. STERLING. They had quit at the time of the strike?

Mr. EAGLE. No; they had quit to take other positions.

The CHAIRMAN. What does W. I. W. mean? I guess that is Wabisha Iron Works.

Mr. STERLING. Had they tried to get back?

Mr. EAGLE. Yes. That is, they were out of a job and tried to get other positions.

Mr. STERLING. This gentleman who was here the other day said you had interviews with these men?

Mr. EAGLE. Not interviews.

Mr. STERLING. Does that show from the statements why they were not taken back into the employ of the Steel Corporation?

Mr. EAGLE. No. In neither instance did they have any impression they were on the black list. They just knew they could not get connected up again with the Carnegie Steel Co. They did not know why. They thought they apparently had left in good standing.

Mr. GARDNER. You found two men who said they tried to get back and could not?

Mr. EAGLE. Yes.

Mr. GARDNER. Were those men discharged for being labor organizers or labor agitators? Were they blacklisted because of that or for other causes?

Mr. EAGLE. I could not answer that.

Mr. GARDNER. What were their names?

Mr. STERLING. He says they quit of their own accord.

Mr. EAGLE. John Thomas is the name of one man.

Mr. GARDNER. Is this list in alphabetical order?

Mr. REED. In no kind of order, either in reference to dates, companies, or anything else; just a hodgepodge of names.

Mr. GARDNER. Did you look up this John Thomas?

Mr. EAGLE. Yes.

Mr. GARDNER. What had he been discharged for?

Mr. EAGLE. He had not been discharged.

Mr. GARDNER. What was the annotation against his name on the alleged blacklist?

Mr. EAGLE. For cause, I believe.

Mr. GARDNER. He was not one of these labor agitators?

Mr. EAGLE. No.

Mr. GARDNER. Who was the other man you saw?

Mr. EAGLE. A man named Harry Watkins.

Mr. GARDNER. What was entered against his name?

Mr. EAGLE. For cause, also, I believe. I am subject to correction.

The CHAIRMAN. Do you remember going to see a man named John Harrigan, of the American Steel Wire Co.? I see he is listed for coming in the mill through the wrong entrance.

Mr. EAGLE. No; I do not believe so.

The CHAIRMAN. Did you give us a man named William Hamley?

Mr. EAGLE. No. I would like to make a statement in regard to the men we tried to interview. This man Morgan, who brought in the list, gave me certain names of men whom he said were still in town and whom we could see and get confirmation of what he said—from whom we could get their stories. Of course, any names that were on this list that he gave me I did not undertake to look up at all. In several instances of the names of the men that he gave me as it being posible to see, and as still living in Pittsburgh, we found had gone away—had droped out of sight in some way.

Mr. YOUNG. Did you publish anything in the Leader regarding this matter?

Mr. EAGLE. We printed a story some day or so after we got this list saying we would print the blacklist of the Carnegie Steel Co. We never did so, however.

Mr. YOUNG. Why did you not?

Mr. EAGLE. Because we found it was too old, and that, together with the fact he wanted too much money, we thought, from a news standpoint, deterred us.

The CHAIRMAN. Did you go to see a man named William Hamley, of the E. F. Co.? What company is that? The charge was refusing to work straight time on Sunday.

Mr. EAGLE. No.

The CHAIRMAN. Here is one named P. Hughes, charged with refusing to work straight time on Sunday.

Mr. EAGLE. No.

Mr. REED. May I suggest a question, as to whether the witness, in the course of this hearsay that he got from Morgan, got the impression that this list was ever allowed to go outside of the Steel Corporation or the Carnegie Steel Co., or whoever was supposed to have had it?

My understanding of a blacklist is one that is evidence of conspiracy among a number of different employers not to engage the services of a particular person.

Mr. YOUNG. That is a proper question, and I will put it.

Mr. GARDNER. There is a little more than that. While I admit it requires circulation amongst other employers to constitute conspiracy, at the same time where a large number of subsidiaries have come together, constituting the great employer of the neighborhood, I think it is competent to ask whether the blacklist circulated amongst those subsidiaries, although they were all under the Steel Corporation.

Mr. YOUNG. That is Mr. Reed's question.

Mr. REED. We might add that question to the other question.

Mr. GARDNER. I mean there are two distinct things there. I will confess, from the appearance of that list, I can not imagine how it could have circulated, because it looks to me like a collection of documents made from time to time for the Carnegie Steel Co., or whatever it is.

Can you tell me when the Clairton Steel Co. was acquired?

Mr. REED. It was bought about in 1904.

Mr. GARDNER. I notice several entries referring to the Clairton Steel Co.

Mr. REED. It was in 1904, I think.

Mr. YOUNG. Did Morgan make any statement to you, that you recollect, as to whether this was a list kept by the Carnegie Co., or kept by the Carnegie Co. with other companies, and circulated by the Carnegie Co. among other companies?

Mr. EAGLE. I can not remember. This was some year and a-half or two years ago, and since then many matters have come up.

Mr. YOUNG. You spoke of it as the Carnegie blacklist?

Mr. EAGLE. That is my recollection. He stated it not to me, but in my presence, in the office.

Mr. YOUNG. That is, what you understood he was trying to sell was a blacklist kept by the Carnegie Co.?

Mr. EAGLE. That is it.

Mr. STERLING. Had he been discharged from employment?

Mr. EAGLE. I do not know.

Mr. STERLING. Or did he quit of his own accord?

Mr. EAGLE. I do not know.

Mr. GARDNER. Do you know whether or not he was ever in the employ of the Carnegie Co.?

Mr. EAGLE. I know nothing except what he told me.

Mr. STERLING. He said he had been?

Mr. EAGLE. He said he had been a labor agent, I believe.

Mr. STERLING. What did he mean by labor agent?

Mr. EAGLE. I did not ask him.

Mr. GARDNER. What did you think he meant, that he had been somebody they employed to get labor for them?

Mr. EAGLE. I do not know that I gave the matter very much thought. I presumed he was some sort of an investigator in regard to labor conditions.

Mr. GARDNER. That he was a confidential employee of the Carnegie Co., who rather kept them informed of labor conditions?

Mr. EAGLE. That is my deduction—not necessarily correct, however.

Mr. GARDNER. That is what you understood him to be? You did not understand him to be by profession a labor organizer representing employees, but rather somebody representing the company. That is what I want to get at.

Mr. EAGLE. No; I did not give the matter any great depth of thought.

Mr. DANFORTH. When did you get this list for your paper?

Mr. EAGLE. The paper got it, I should say, a year and a half ago; maybe a little more than that.

Mr. DANFORTH. In 1910?

Mr. EAGLE. Possibly.

Mr. YOUNG. The strange thing about this is that there is no chronological order about it.

Mr. BARTLETT. Is this in the shape now it was when you got it?

Mr. EAGLE. That is the copy I received. It is somewhat more mutilated than it was then.

Mr. BARTLETT. I mean as to arrangement.

Mr. EAGLE. I believe so. The leaves are loose, however; they might have gotten mixed up.

The CHAIRMAN. I see a man by the name of Pat McCoy, against whose name is marked, "Dissatisfied with wages." Do you know anything about him?

Mr. EAGLE. No, sir.

Mr. GARDNER. That is the reason he left the employ; not that he was discharged, Mr. Chairman.

Mr. YOUNG. The list does not show.

The CHAIRMAN. That is what is marked against him.

Mr. GARDNER. Is there anything to show he was discharged, or that he left the employment?

The CHAIRMAN. No. I see another case of a man by the name of David Morrison, "Dissatisfied with wages." Do you know anything about him?

Mr. EAGLE. No, sir.

The CHAIRMAN. John Mulcahey, American Steel Wire Co., 1901, "For belonging to Machinists' Union."

Mr. GARDNER. What date is that?

The CHAIRMAN. 1901.

Mr. DANFORTH. I suggest there is no use of reading this over. It was all before the corporation was organized.

The CHAIRMAN. There are some dates later.

Mr. DANFORTH. But what you are reading is prior to the date of the organization of the corporation.

Mr. GARDNER. There are a vast number the chairman is not reading. What are they all for?

The CHAIRMAN. They are for cause—for labor agitators.

Mr. YOUNG. Did you read out any of those labor agitators?

The CHAIRMAN. I have not read any. It was the odd ones that I was reading. Most of them are for cause. Some of them have all sorts of entries here which are interesting.

Mr. YOUNG. Where a man is noted as "dissatisfied with wages" would rather give the impression he left himself.

Mr. REED. While the chairman is looking for some more peculiar ones I would like to say to Mr. Gardner that I can not see any offense, even if this list was circulated among the subsidiary companies, about which I know nothing.

Mr. GARDNER. I do not know anything about your law, but it was a question which arose in my mind—I quite admit the right of any company to keep its own black list—to say, "I don't want this man" or "I don't want that man."

Now, if it is circulated among other companies it seems to me to be in the nature of conspiracy when it is circulated amongst other companies with whom you are—I won't say allied—but when it is circulated amongst a number of other subsidiaries of the same corporation.

While I do not know that there is anything that has hitherto been considered improper about it, the question naturally suggests itself to a man's mind whether the circumstances would have been altered as to what is and what is not proper when you have got the whole or the employment of 50 per cent of labor under one head. Do you see, Mr. Reed?

Mr. REED. I catch your idea.

Mr. GARDNER. It is a question which has been working in my mind since this thing came up the other day, as to whether, granting that Mr. Seldes was right in his evidence and that this circulated entirely amongst the subsidiaries, that did constitute something that needed correction.

Mr. REED. I see.

Mr. GARDNER. Irrespective of whether it was illegal or not at the present time?

Mr. REED. All I wanted to call your attention to in that connection was the fact that it seems to me—not that there is anything unfair in your suggestion or in your thought—unfair to regard the Steel Corporation as a unit when it is convenient to its accusers to do that and to regard it as a group of different entities when it makes an offense.

Mr. GARDNER. That is perfectly true. I tried to throw aside all this winding up of the Steel Corporation and tried in my own mind to clear myself as to the internal verities of a corporation, not as to whether it is legal or illegal, but as to whether it is a thing which is in the internal nature of the thing right or whether it is wrong.

Mr. REED. Of course, I do not want to accuse Mr. Morgan—whoever he is—of producing something that is not genuine. I do not know that the thing is genuine or not; but I am told that all the paper used by the Carnegie Co. bears its watermark, and that list does not. Whether there is anything in that or not I do not know.

Mr. GARDNER. Do you know whether it bore its watermark back in 1904 and 1905?

Mr. REED. That has been there practically a great many years I am told; that it was the custom for a great many years, even before the corporation was formed.

Mr. GARDNER. Still, if they had a list like that circulating it is probable they would not use the watermark on that particular document.

Mr. DANFORTH. But that does not prove anything. Assuming that Morgan made the copy, he could make it on paper he bought from any stationery shop if he was trying to sell the copy.

The CHAIRMAN. I see here in 1902 a great many of men discharged for cause belonging to the National Steel Co., the American Steel & Hoop Co., the American Steel Wire Co., the National Tube Co. In 1903 the National Tube Co., the American Steel Wire Co., the Carnegie Steel Co., the South Sharon. It seems this list pertains practically to all the subsidiaries of the United States Steel Corporation.

Mr. YOUNG. You do not find any outside men, do you?

The CHAIRMAN. I will not be positive about that. Here is the L. U. M. I don't know what company that is.

Mr. REED. I presume that stands for the Lower Union Mills, of the Carnegie Co.

The CHAIRMAN. N. S. Co. That is the National Steel Co.; the National Tube Co.; the Bellaire. Do you know if that is a subsidiary?

Mr. REED. That is the Bellaire Works of the Carnegie Co.

The CHAIRMAN. I do not see any company that is not a subsidiary. It appears this list is made up of men who worked in the various subsidiaries of the United States Steel Corporation.

Mr. GARDNER. Of course it does not appear what purpose that was put to, Mr. Chairman.

Mr. BARTLETT. What are we going to do with it now that we have got it?

Mr. DANFORTH. Find Morgan and return it to him.

The CHAIRMAN. There are a great number of men marked as labor agitators.

Have you any objection to having this list printed in the record?

Mr. EAGLE. I would not like to have it go out of my possession.

The CHAIRMAN. Would you have any objection to having it printed in the hearings?

Mr. REED. I have, until it is proven to come from the Carnegie Co.

The CHAIRMAN. It does no do anybody any harm if there is no harm in it.

Mr. GARDNER. What you are doing now, in reading just a few of the names, might not possibly be doing justice——

The CHAIRMAN. Read all of it.

Mr. GARDNER. I could not read the whole of it. Here are names of thousands of workmen. You have picked out a few cases.

The CHAIRMAN. Most of them are for cause—90 per cent of them.

Mr. GARDNER. I should think it was nearer 95 per cent.

Mr. YOUNG. The trouble, in my mind, is just what it was the other day. We have traced it back just one step. The gentleman received it from a man named Morgan, with whom he had no special acquaintance. Morgan claimed it was a certain thing. If it is to go in at all it ought to be shown it has some particular relation to the steel corporation or some of its subsidiaries. It ought to be shown it was a paper kept by them. Then there would be an opportunity to show what they used it for.

It seems to me to be a list of men most of whom apparently had been discharged for cause, and some would seem to be men who had left of their own accord to go elsewhere.

Mr. REED. And it is dubbed a black list by a man who was trying to sell it for money to a newspaper. I have forgotten most of the rules of evidence since I came to Washington, but it does not seem to me it is competent or relevant.

Mr. YOUNG. I do not think that ought to go in.

The CHAIRMAN. What sort of a looking man was Morgan? I want to find him. I will get to the bottom of this thing if it takes six months.

Mr. EAGLE. He was tall, rather heavy set. My recollection of him is somewhat hazy. It has been some time ago.

Mr. BARTLETT. Could Mr. Moore tell anything more about it than you can?

Mr. EAGLE. I think not.

Mr. BARTLETT. Where is Mr. Moore?

Mr. EAGLE. When I left him he was in Pittsburgh.

Mr. BARTLETT. He resides in Pittsburgh?

Mr. EAGLE. Yes.

The CHAIRMAN. What aged man was Morgan?

Mr. EAGLE. Oh, I should say about 40.

The CHAIRMAN. What time was it you last had a conversation with him on the subject?

Mr. EAGLE. Approximately a year and a half ago.

The CHAIRMAN. He was then living in Pittsburgh?

Mr. EAGLE. Yes.

Mr. BARTLETT. Who else, besides you and Mr. Moore, had a conversation with this man at the time he exhibited this book and said this list you have here was a copy of it?

Mr. EAGLE. Mr. Emge, the managing editor.

Mr. BARTLETT. Where does he live?

Mr. EAGLE. He is in Pittsburgh also.

Mr. BARTLETT. Is he there now?

Mr. EAGLE. Yes.

Mr. BARTLETT. Do you think he would have any more recollection of it than you?

Mr. EAGLE. I am certain he would not.

Mr. BARTLETT. Have you discussed the matter with Mr. Emge and Mr. Moore since you got the subpœna—any time recently?

Mr. EAGLE. Me?

Mr. BARTLETT. Yes, you.

Mr. EAGLE. I have, yes; but they did not know anything more about it than I do.

Mr. BARTLETT. That is the reason you say their recollection is no clearer or more definite than yours?

Mr. EAGLE. Yes.

Mr. BARTLETT. According to your interview with them?

Mr. EAGLE. Yes. We were all very loathe to have the matter come out in this way. I wish to state that for the paper.

Mr. GARDNER. In your opinion, is that book in existence to-day?

Mr. EAGLE. I presume it is. He considered it valuable. I do not think he would destroy it.

Mr. GARDNER. He must have gone to other papers besides you, or to other syndicates. I believe you said the proposition was to sell it to a syndicate?

Mr. EAGLE. I understood so.

Mr. GARDNER. Did you refer that question to the other members of the syndicate?

Mr. EAGLE. There is no syndicate.

Mr. GARDNER. I thought you said he proposed to sell it for $5,000 to a syndicate of newspapers?

Mr. EAGLE. What I said was: He wanted to syndicate it. That is a newspaper expression, meaning to contract with different papers to take this for a certain sum—probably not for $5,000 each.

The CHAIRMAN. Each paper would contribute its proportionate part?

Mr. EAGLE. Yes.

Mr. BARTLETT. Like these weekly plate sheets—magazine articles?

Mr. EAGLE. Yes, sir; that is the idea.

Mr. GARDNER. Have you heard of his approaching any other paper?

Mr. EAGLE. No; I have not heard directly.

Mr. GARDNER. Did he express any intention of approaching any other paper?

Mr. EAGLE. He may have; but I did not overhear it.

Mr. BARTLETT. Did he say whether he had offered it to somebody else, or somebody else had offered him a price for it?

Mr. EAGLE. He did not say so to me, or in my hearing.

Mr. BARTLETT. He thought it was a good sensational story that the papers would like to have?

Mr. EAGLE. That is what he considered it.

The CHAIRMAN. Did he say from whence he had secured this book—from what company he had gotten it?

Mr. EAGLE. My impression was—although he may not have said it—that it was from the Carnegie Steel Co.

The CHAIRMAN. He had worked for the Carnegie Steel Co.?

Mr. EAGLE. Yes.

The CHAIRMAN. And most of the names that are mentioned here are names of employees of the Carnegie Steel Co.?

Mr. REED. If the witness knows.

The CHAIRMAN. Do you know?

Mr. EAGLE. No; I do not know.

The CHAIRMAN. A good many of them I read were.

Mr. REED. A good many of the initials on the list appear to be the initials of Carnegie Co. mills.

Mr. BARTLETT. Well, let us decide about this matter.

The CHAIRMAN. I am perfectly willing to have the committee decide it. If any member of the committee objects, I would not insist on having it printed in the record. If the witness wants to take the list back, I could have a copy made of it.

Mr. DANFORTH. In the absence of objection, would the chairman care to have it printed in the record?

The CHAIRMAN. I would.

Mr. DANFORTH. As material evidence in connection with the inquiry we have been authorized to make?

The CHAIRMAN. Yes.

(Informal discussion followed, which the stenographer was directed not to report.)

Mr. EAGLE. I think it is not fair to the paper to let it come out. It was turned over to us for one specific purpose. We did not avail ourselves of the opportunity and purchase it. You force me to come down here and testify and break one of the most sacred laws of journalism.

The CHAIRMAN. If you object, of course I will not insist on its being printed. The chairman wants to be agreeable to all parties concerned. Did you believe it was not an authentic list?

Mr. EAGLE. In the newspaper business we do not believe anything until we investigate.

The CHAIRMAN. You are excused, Mr. Eagle. We are very much obliged to you.

The committee will stand adjourned, to meet again at the call of the Chair.

Thereupon, at 1.30 o'clock p. m., the committee adjourned, subject to the call of the Chair.

United States Steel and Carnegie pension fund.

Trustees.—Frank D. Adams, Duluth, Minn.; Raynal C. Bolling, New York, N. Y.; William B. Dickson, New York, N. Y.; Robert A. Franks, New York, N. Y.; Elbert H. Gary, New York, N. Y.; James H. Hoyt, Cleveland, Ohio; Kempker K. Knapp, Chicago, Ill.; George W. Perkins, New York, N. Y.; James H. Reed, Pittsburgh, Pa.; Andrew Squire, Cleveland, Ohio; Charles L. Taylor, Pittsburgh, Pa.; Hampden E. Tener, New York, N. Y.

Finance committee.—Elbert H. Gary (chairman), Robert A. Franks, George W. Perkins, James H. Reed, Hampden E. Tener.

Pension committee.—Raynal C. Bolling (chairman), Elbert H. Gary, James H. Reed, Charles L. Taylor.

General executive officers.—Elbert H. Gary, chairman, New York, N. Y.; Charles L. Taylor, vice chairman, Pittsburgh, Pa.; Robert A. Franks, treasurer, New York, N. Y.; Raynal C. Bolling, secretary, New York, N. Y.

J. B. Erskine, manager; J. H. Wood, assistant manager, Oliver Building, Pittsburgh, Pa.

The United States Steel and Carnegie pension fund was established in the year 1910 by the joint action of the United States Steel Corporation and Andrew Carnegie. Its purpose is the payment to employees of old-age pensions from the income of the fund. For this purpose the United States Steel Corporation provided $8,000,000, which, with the Carnegie relief fund of $4,000,000, created by Andrew Carnegie on March 12, 1901, makes up a joint fund of $12,000,000. This pension fund is administered by a board of 12 trustees, through a manager appointed by the board with such powers and duties as may be given him by the board. The pension rules are established by resolution of the board of trustees.

PENSION RULES.

WHO MAY OBTAIN PENSIONS.

1. Employees of the United States Steel Corporation or of any other corporation a majority of whose capital stock is owned or controlled by the United States Steel Corporation, or of the board of trustees of this pension fund may obtain pensions under the following conditions:

FIRST.—*Pensions by compulsory retirement.*

2. All men who have been 20 years or longer in the service and have reached the age of 70 years shall be retired and pensioned.

3. All women who have been 20 years or longer in the service and have reached the age of 60 years shall be retired and pensioned.

4. At the request of their employing officers persons employed in executive or administrative positions may be allowed to continue in active service after reaching the ages mentioned above.

SECOND.—*Pensions by retirement at request.*

5. Any man who has been 20 years or longer in the service and has reached the age of 60 years may be retired and pensioned either at his own request or at the request of his employing officer.

6. Any woman who has been 20 years or longer in the service and has reached the age of 50 years may be retired and pensioned either at her own request or at the request of her employing officer.

THIRD.—*Pensions for permanent incapacity.*

7. Any employee who has been 20 years or longer in the service and has become permanently totally incapacitated through no fault of his or her own as a result of sickness or injuries received while not on duty may be pensioned at the discretion of the board of trustees.

AMOUNT OF PENSIONS.

8. The monthly pensions to be paid will be made up on the following basis, subject to the provisions of section 27:

For each year of service 1 per cent of the average regular monthly pay received during the last 10 years of service.

Illustration.—An employee who has been 25 years in the service and has received an average regular monthly pay of $60 a month will receive a pension allowance of 25 per cent of $60, or $15 a month.

9. No pension granted shall be more than $100 a month or less than $12 a month.

HOW TO OBTAIN PENSIONS.

PENSIONS BY COMPULSORY RETIREMENT.

10. Employing officers will report to the manager of the fund the name of every man who has been 20 years or longer in the service and has reached the age of 70 years, and of every woman who has been 20 years or longer in the service and has reached the age of 60 years. These reports will be sent to the president of the company concerned for his approval.

PENSIONS BY RETIREMENT AT REQUEST.

11. Any man who has been 20 years or longer in the service and has reached the age of 60 years, and any woman who has been 20 years or longer in the service and has reached the age of 50 years, who wishes to be retired and pensioned, should notify his or her employing officer.

12. Any employing officer who wishes to retire an employee who has reached the age and has had the length of service fixed for retirement by request must notify such employee and report to the manager of the fund the request that such employee be retired and pensioned. These requests, whether from an employee or an employing officer, will be sent to the president of the company concerned for his approval.

PENSIONS FOR PERMANENT INCAPACITY.

13. Any employee who has served 20 years and who is permanently totally incapacitated through no fault of his or her own, as a result of sickness or injuries received while not on duty, may notify his or her employing officer and apply for a pension. Every such application will be sent by the employing officer to the president of the company concerned for his approval. In every such case it must be shown to the satisfaction of the board of trustees by physical examination that the employee applying for a pension is permanently totally incapacitated to earn a livelihood.

GENERAL REGULATIONS.

14. Pensions from the fund will be paid only to those employees who have given their entire time to the service of corporations included under the provisions of the fund.

15. The acceptance of a pension from the fund shall not bar any former employee from engaging in other business so long as such other business is not of the same character as the former employment. No employee receiving a pension may reenter the service.

16. Length of service shall be reckoned from the date since which the employee has been continuously in the service to the date when retired, and a part of a year, if less than a half, shall not be counted; if more than a half, it shall be counted as a full year.

17. Leave of absence, suspension, temporary lay-off on account of reduction in force, or disability shall not be considered as breaks in the continuity of service, and time thus lost shall not be deducted in reckoning the length of service.

18. Dismissal or voluntarily leaving the service, followed by reinstatement within two years, shall not be considered as breaks in the continuity of service, but the time thus lost shall be deducted in reckoning the length of service.

19. The board of trustees shall fix the date in each case, upon which the pensions shall begin.

20. Pensions shall be paid monthly at the close of each month, unless revoked by the board, and shall terminate with payment for the month succeeding that in which the death of the employee occurs.

21. Whenever the terms "service" and "in the service" are used in these rules they mean employment by the United States Steel Corporation, by one or more corporations a majority of whose stock is owned or controlled by the United States Steel Corporation, by their predecessors, or by the board of trustees of this fund.

22. Pensions may be withheld or terminated in case of misconduct on the part of the beneficiaries or for other cause sufficient in the judgment of the board of trustees to warrant such action.

23. In order that direct personal relations with retired employees may be preserved and that such employees may continue to enjoy the benefits of pensions granted them, no assignment of pensions will be permitted or recognized under any circumstances; neither shall pensions be subject to attachment or other legal process for debts of the beneficiaries.

24. This pension plan is a purely voluntary provision for the benefit of employees superannuated or totally incapacitated after long and faithful service, and constitutes no contract and confers no legal rights upon any employee.

25. The manager of the fund shall decide all questions arising out of the administration of the fund and relating to employees, subject to a right of appeal to the board of trustees within 30 days after notice to the persons interested of the manager's decision. The action of the board of trustees or of any committee designated by the board to hear such appeals shall be final and conclusive.

26. Neither the creation of this fund nor any other action at any time taken by any corporation included under the provisions of the fund or by the board of trustees shall give to any employee a right to be retained in the service, and all employees remain subject to discharge to the same extent as if this pension fund had never been created.

27. Whenever it may be found that the basis named for pensions shall create total demands in excess of the annual income increased by any surplus deemed applicable by the board of trustees, a new basis may be adopted reducing the pensions theretofore or thereafter granted so as to bring the total expenditures within the limitations fixed by the board of trustees. Notice of such new basis shall be given before the beginning of the year in which it may be decided to put the same into effect. These pension rules may be changed by the board of trustees at its discretion.

28. An annual report, giving an account of the fund and its administration, will be made as soon after the first of each year as practicable, and copies of such report will be posted at all mills, mines, railroads, shops, and other works and published in such newspapers as may be designated by the board of trustees.

By order of the board of trustees, these rules for the administration of this fund shall take effect on January 1, 1911, and shall apply to those who are in the service on and after that date.

[The Survey, November 4, 1911.]

The human side of large outputs—Steel and steel workers in six American States.

II.—ILLINOIS: BOOSTING FOR SAFETY.

[John A. Fitch, member staff (1907–8), Pittsburgh Survey.]

The first steel rail made in America was rolled at the works of the North Chicago Rolling Mill Co. Outstripped for a generation thereafter in steel output, as it had been in iron, Chicago is to-day forging to the front as one of the greatest steel-producing centers in America. On the north is the American Steel & Wire Co.'s mill at Waukegan; in South Chicago are the plants of several minor concerns, besides the immense works of the Illinois Steel Co.; at the southwest is Joliet, with plants of importance; on the south shore of Lake Michigan is Indiana Harbor, with a plant of the Inland Steel Co., an independent, and, finally, Gary itself. The supremacy in steel will not pass from Pittsburgh to Chicago to-morrow, nor the day after, but no one can blink the fact that already this section is producing an enormous tonnage. Not less than 30,000 men are employed in the reduction of ore and in making, working, and fabricating steel.

A good many reasons have been given for the stride forward taken in the past 10 years by the lower Lake Michigan steel district. One is the nearness to the Minnesota ore fields. Another is the Illinois coal mines. Neither of these seem adequate, for ore can be transported with almost equal cheapness anywhere on the Great Lakes, and there is no coal so adapted to coking as that from the Connellsville district, near Pittsburgh. The real reason would seem to be the development of the West, where new railroads are being built, cities are growing, skyscrapers going up. There is need of a mid-western manufacturing and distributing point commensurate with the demand for steel, and the Chicago plants have grown in answer to that need, just as there is prospect to-day of the development of Duluth as a manufacturing and distributing point still farther to the north and west.

In Chicago the biggest and most important manufacturer of steel is the Illinois Steel Co., and it is not only the biggest in Chicago, but the biggest in the West. With plants at Milwaukee, Joliet, Chicago, and Gary, it employs in normal times about 25,000 men. It was the Illinois Steel Co. that built the Gary steel plant, with its own men, and now that it is built the Illinois Steel Co. is operating it.[1]

The south works of the Illinois Steel Co. employed 6,000 men in 1900, before it was taken over by the United States Steel Corporation. To-day, when the plant is on full time, it employs 10,000 to 11,000. Since 1900, 3 blast furnaces have been added to the 8 then in blast, a second open-hearth department, with 14 furnaces, has been constructed, more than doubling the capacity for open-hearth steel. There have been added 2 blooming mills, 2 structural mills, and a universal plate mill.

It is a great plant, extending for 2 miles along the shore of the lake—one of the greatest plants in the world—but many South Chicago people think that it might have been very much larger. The town and plant at Gary would never have been built, they declare, if South Chicago had been rightfully treated.

"The big plant would have been built here instead of at Gary," a bluff old South Chicago citizen explained to me, "if it hadn't been for a damn little cuss of a public works commissioner, under a Democratic mayor we had, named Dunne. * * * This fellow was a Socialist, and he thought he was bigger than the people of Chicago."

The commissioner in question was Joseph Medill Patterson, formerly one of the editors of the Chicago Tribune, a successful playwright and author of several well-known books. His offense consisted in trying to enforce the law. It seems that the South Chicago plant, being surrounded on three sides by property not owned by the company, could expand only in one direction—into the lake. So for many years slag was dumped into the lake for filling and new land slowly made. There was no legal sanction for such appropriation of the lake bottom, and when, during Mayor Dunne's administration, the company wished to start new construction, Commissioner Patterson refused a permit and

[1] The Indiana Steel Co. is the company that owns the Gary plant—on paper—and the Illinois Steel Co. is the lessee; but both companies occupy the same offices in Chicago and have the same officers.

started suit to recover the land already built upon beyond the old shore line. This stopped expansion for a time, and the Gary plant was started afterwards; but one has only to look at the Gary plant, extending 2 or 3 miles along the lake and in from the shore for a mile, to realize how impossible it would have been to build so great an industrial establishment at South Chicago on made land.

There is no need to record again the tremendous engineering feats necessary to the creation of the Gary plant in 1906 and after. The story has been told often enough of how the tracks of a half dozen railroads were picked up and flung a few miles to the south, of how a river was moved, how hills and trees were eliminated and a harbor was dredged fit to accommodate the great ore boats, and, finally, how a city was built, paved and sewered and lighted, where there had been the day before but a waste of sand dunes.

There were 6,000 men in the plant when I visited it last winter. I would not have guessed that there were a third of that number, the plant and the machinery are so big and overpowering. The enormous ore unloaders, skeletonlike, uncanny, where 2 men do the work that 50 used to do; the blast furnaces, among the biggest in the country, so automatic that the labor force is 25 per cent less than the average for blast furnaces; the spaciousness of the great sheds, with their high roofs—all tend to give impressiveness to the plant.

To this plant has been gathered an army of men. Skilled and unskilled they have come; native and alien, Teuton, Celt, and Slav; English-speaking men and men who speak strange tongues; men who have fed furnaces in Pittsburgh, who have pulled levers at Lackawanna, who have riveted cars at Johnstown, pulled scrap from the shears at Pueblo, or bossed negro gangs in Birmingham. And men have come, too, from farms and hamlets of Bohemia and Hungary, Servia and Montenegro—come to a new world, to new work, to machines and wonders of which they never before had dreamed—to a new opportunity.

Thus a new plant and a new community has been formed, without tradition, without old scores, with no past, only a future. There was here no Irish turbulence at the blast furnaces; there were no stubborn Welsh puddlers to reckon with. The stolid Slavs are taking care of the giant stacks and the puddling furnaces are no more.

Gary is probably destined to be greater in the annals of steel making than South Chicago, because the construction engineers had before them the mistakes of years in other plants. What South Chicago has found was wrong and has had to patch up Gary has avoided through construction. The straight hauls at Gary, the iron ore starting at one end of the plant and the finished material coming out at the other, the lack of congestion the broad-gauge tracks instead of the "dinkeys," the powerful engines, the enormous cranes—all are suggestive of economy and speed.

"If," said an official of the plant, "we do not make steel more cheaply here at Gary than anywhere else in America, the building of the plant will not have been justified."

Gary's five-year story is a thrilling one. South Chicago's advance has been less exciting because, like Rome, it was not built in a day. Steel was first made at the South Works in 1882, and the growth since then has been steady and nonspectacular. Yet, without the leaps and bounds in growth which have challenged the attention of the world at Gary, the South Chicago plant has developed until amazing deeds are matters of daily occurrence. From 11 blast furnaces 4,500 tons of iron are tapped every 24 hours, more than 400 tons to each furnace. The Bessemer and open-hearth departments together produce 240 tons of steel every hour, while the rail mill turns out every day 40 miles of 80-pound rails, enough for 20 miles of track. It is not in Pittsburgh alone that big things are done.

The growth of a great plant, the sudden springing into being of another, and the mechanical efficiency of both are very impressive. But of greater significance is the force that gives effectiveness to both plant and machine—managerial efficiency. A group of men of unusual capacity for organization and leadership are directing the development and operation of these remarkable plants, and this is more important than any machinery, however automatic and useful.

It is this leadership and the efficiency of compact organization that is the great thing about the Illinois Steel Co., for it has to its credit an achievement more important than the installing of new engines or beating the tonnage record of the world or building a city overnight. It has to its credit a record of human conservation. It has not made its plants absolutely safe. There will always be danger in making steel. But it is playing a leading part in

putting a stop to that mad waste of life and limb that four years back made the steel industry a hell.

The Illinois Steel Co. had had a safety department at its South Works for a good many years prior to 1908. For a good many years men had reported on unsafe conditions and recommended improvements. But, nevertheless, for many years the accident and death roll of the plant was a shocking revelation of the feebleness of human economy in plant operation. In 1906, 46 men lost their lives in the South Chicago mill. To quote William Hard:[1]

"Twelve of them were killed in the neighborhood of blast furnaces. One was hurled out of life by a stick of dynamite. Three of them were electrocuted. Three of them were killed by falls from high places. Four of them were struck on their heads by falling objects. Four of them were burned to death by hot metal in the Bessemer converter department. Three of them were crushed to death. One was suffocated by the gas from a gas producer. One of them was thrown from an ore bridge by a high wind. One of them was hit by a red-hot rail. One of them was scorched to death by slag. And 10 of them were killed by railroad cars or by railroad locomotives."

Hard published his article in November, 1907. The next spring a new policy was inaugurated by the Illinois Co. A closer organization was effected and all of the plants brought into harmony in an effective, determined campaign for safety. In 1910, 14 men instead of 16 lost their lives at the South Works, in this new campaign a spirit of enthusiasm, effective and unique, was set on foot. A central committee of safety was formed, consisting to-day of the safety inspector and the assistant general superintendent from each plant, an official from the statistical department who acts as secretary, and a representative of the legal department in charge of personal-injury matters. The general attorney of the company acts as chairman of the committee.

In each plant two classes of safety committees were formed, workmen's committees and permanent committees. Each of the larger plants is divided into three or four divisions and in each division three workmen are appointed to serve two months and look out for the safety of the division. They spend one day each two weeks looking for dangerous places and talking with the men in order to get suggestions as to safety. The permanent committees are made up of groups of foremen. There is a permanent committee for each department which inspects the department once each month to see that safety devices have been installed and to investigate accidents.

The scope and effectiveness of the work of this safety organization is notable. The inspections are far more searching than the factory inspection work of any of our State governments. The workmen's committees are followed up by the permanent committees and both by the chief inspector, and his work in turn is checked by the chairman and secretary of the central safety committee. Special workmen's committees are appointed now and then to inspect other plants for new ideas, and in each department skilled experts, not members of the committee, make inspections from time to time.

The central committee is working out standard safety devices and rules and no new machinery is installed unless approved by the safety experts. No blue print is allowed to leave the drafting room until it has been checked for safety. Foremen are examined from time to time on their knowledge of safety rules and a foreman who persistently fails to familiarize himself with them is discharged or transferred.

With Chairman Campbell, of the central safety committee of the Illinois Co., I went through the South Chicago and Gary plants, and I was everywhere impressed with the spirit that prevails among superintendents, foremen, and men of resistance to unsafe methods. It is a new spirit and one destined to accomplish incalculable good. By ingenious methods the spirit is fostered and made to grow. The slogan is "Boost for safety," and everybody boosts. It is a contagious thing. One of the safety men said to me, "Why, I can't pass an obstruction on the sidewalk any more. I've got to stop and throw it off."

This new, organized, and resourceful attack upon the danger zones of production is not unique with the Illinois Steel Co. Similar work is done by the other subsidiary companies of the United States Steel Corporation. With the formation of a central safety committee in April, 1908, made up of safety men from these different managements, a concerted movement was inaugurated which has been carried a stage further the past year in the transfer of the safety expert of the National Tube Co. to headquarters, to carry on clearing-

[1] Making Steel and Killing Men. Everybody's Magazine, November, 1907.

house methods between the different offices. Apart from this general interchange, each company, however, develops its safety work along individual lines; and it is the team play of its central committee that gives distinction to the work of the Illinois Co.

Workmen are encouraged to make suggestions, and some of the most valuable ideas come from them. Safety inventions are paid for. At South Chicago when I visited the plant a man in the pattern shop had just perfected a circular-saw guard which was the pride of the shop. Another had made an improved belt shifter. And the thing that impressed me was that these inventions were commended as highly as if they had been designed to boost output instead of safety.

Bulletin boards are scattered through the mills, and every two weeks the departments that get into the "booster class"—those that have kept the accident rate down to a minimum—are posted. The boards are used in various ways to inculcate habits of caution. The day before I visited the South Chicago plant a man's eye had been saved from a metal splash by the goggles he wore. The metal-encrusted goggles were immediately photographed and the photograph placed on the bulletin boards as an example to the workmen.

I attended a meeting of the central safety committee and in it I think I discovered the secret of the remarkable work that has been accomplished—and that is going on—that has reduced the number of fatalities in the South Chicago plant from 46 in 1906 to 14 in 1910. At first I thought it was because the chief safety inspectors are not operating men, and have no responsibility as to output. But in the committee I found the superintendents—the operating men—as eager for safety as were the inspectors. Perhaps it is thought that spending money for safety will save money for the company in the long run. I think it will. But that was not what the safety committee talked about that morning. A man in one of the plants had had the end of a finger taken off by a piece of moving machinery that had a hole in it just the size of his finger. He had put his finger into that hole. The discussion brought out the fact that the same hole was to be found on similar machines in all the plants. The committee decided that these holes must be covered or filled. Another man had slipped and fallen as he walked, inside the plant, to his work. It was found that ashes had been sprinkled in slippery places, but it was ordered that this be done more carefully.

From accidents the committee turned to a consideration of recommendations on safety devices, from foremen's committees and from workmen's committees. None of these were revolutionary. They were detailed, accompanied by designs, and involved simple changes in method or the installation of minor safety devices. They were all considered, some were passed upon, and others were put over until the next meeting. It was not apparent to me that all of this deliberation would work the financial advancement of the company. There was something in that meeting that can be explained only on the ground of humanitarianism. It impressed me strongly and gave me more faith in my fellow men.

All this spells achievement of a high order. The quiet growth of a plant 30 years old, the building of a new one, the devising of a new scheme for saving men's lives, the building of a city; it is all a story of things done, things that only strong men can do. And such achievement inevitably brings two other factors into play, responsibility and opportunity. Of the former I shall say little, for it is self-evident. The latter is too tremendous for full discussion, but I can sketch in the barest outline some of the things that are comprehended today in the unparalleled opportunity now open to the Illinois Steel Co.

The most obvious opportunity, three years ago, was to set a new standard for safety. Now an even larger opportunity is beginning to present itself. Some of the members of the safety committee have begun to think that if humanity and business alike dictate that men's lives and limbs ought to be protected against the danger of accident, by the same token men's bodies should be protected against disease.

That phase of disease most closely akin to the accident problem is infection; and nowhere else as in the absolute and prompt control which the hospital corps of these larger plants have over the treatment of flesh wounds, major and minor, is there such an opportunity for the reduction of infection to a minimum. This is a field in which the Carnegie Steel Co. has made notable advances among its scattered plants in the Pittsburgh district, where a larger administrative problem is of course involved. There is a hospital at South Chicago, where the injured men are cared for. It is an old one, and while it does effective service it does not represent the best that could be desired. But at Gary, where

the Illinois Co. could build everything new, there is one of the finest hospitals in the United States. It is a plant such as few cities in America have supplied for themselves.

The central safety committee had as a topic for discussion at a recent meeting the question of a sanitary water supply and sanitary drinking cups. At present drinking water is brought into the mills in ordinary wooden pails and poured into barrels. A cake of ice is kept in each barrel, and when a man wants a drink he takes the cover off and dips up the water with a tin cup. The next man uses the same tin cup, although venereal disease is known to be prevalent among certain classes in the mills. The Chicago company could well afford to follow the example of the National Tube Co., which is installing in its plants a circulatory, ammonia-cooled water system, with fountain drinking cups. For many years the steel companies have had gas washers connected with their blast furnaces to remove dust from the gas before it enters the stoves. This sanitary drinking-water system will afford equal protection to men.

After this the safety committee might spend some very profitable meetings discussing heat. At South Chicago there are tubes delivering cool air to men in some of the hottest positions. At Gary high roofs have done much to improve ventilation. But it has not yet become possible to make steel without subjecting men to great heat. Workmen go with open pores and clothes wet through with sweat out from the mills into the cold winter air. Such a radical change in temperature, day after day, is extremely dangerous, and rheumatism and bronchial and pulmonary diseases are common in steel-mill communities. Shower baths and a change of clothing before leaving the mill would help to prepare the men for the shock of contact with the cold air. At Gary showers were installed at the open-hearth furnaces, but the men did not use them, so they were taken out. South Chicago had the same experience at the open-hearth furnaces, but the showers in the Bessemer department have been and are used by the men. There may be a significance in the fact that the Bessemer men have an 8-hour day while the open-hearth men work 12 hours. Perhaps the latter feel that so little of the day is left when the end of a turn comes that they want to get out as fast as possible and get a grip on the time that remains and is their own. Be that as it may, the National Tube Co. has not been deterred from installing shower baths by the fact that the men do not use them as might be hoped. Showers have been installed in many departments in their plant at McKeesport, and are eventually to be installed in all departments in all plants. An official of that company remarked to me: "It is not our fault if the men don't use the baths, but it is our fault if the baths are not there to be used, and if they are there the men will learn after awhile to use them." The Tennessee Coal, Iron & Railroad Co., at Birmingham, is also installing baths in all departments.

The report made by the Illinois Commission on Occupational Diseases last January contained a section on carbon-monoxide poisoning. The reports state that on one day, October 15, 1910, 28 men were overcome by carbon-monoxide gas in one blast-furnace plant. This was conceded to be an unusually large number, but the fact was ascertained that among 900 men employed in the blast furnaces studied there have been, in the last 4 years, 13 fatal cases of gassing, and that there have been averages of 65 severe cases and 216 mild cases each year. These were the cases actually found. The report adds that the "real number occurring would be much higher, since mild cases are never recorded and are often forgotten." In addition to these occurrences at the blast furnaces, it was found that other danger points are the boiler houses, gas engines, and the open-hearth furnaces.

One immediate and direct danger was found to be connected with gassing—that of falling from a height or into molten metal when overcome. The report says, on page 93, "Of 22 men actually gassed and immediately rescued, 3 showed notable burns and 3 showed bruises, demonstrating that they were deeply and rapidly narcotized. We cite the case of one worker who was burned almost to a crisp before being taken out, and of another who fell to his death 25 feet below. Many other illustrations like these could be given."

The Illinois Steel Co. was commended by the commission for the care it has taken to prevent, as much as possible, the escape of this gas. But as yet no method has been found of preventing all escape, and so accidents occur. One case was found at South Chicago of an employee of the gas-cleaning house who was overcome while sitting in a chair.

But the commission was more concerned with the steady recurrence of mild cases than with the tragic consequences of the severe ones. Men who con-

stantly breathe a little carbon-monoxide gas, who are occasionally overcome, removed to the outer air, and recover and return to work, may well engage the attention of experts. Two hundred and forty such men were critically examined by the commission and some startlingly significant facts were discovered. An excess of red blood corpuscles was found in every case. The layman would be inclined to consider this a favorable condition, but the commission was not prepared to say that it is so.[1] They desired opportunity for further study. But other factors of great significance were found. The men exposed to this gas were submitted to a strength test, and two numerically equal bodies of workmen not exposed were submitted to the same test.

In every case the former were found to be deficient in muscular power.[2]

The commission also found that "the majority of the men examined were below the average, mentally, but *97 per cent of them stated that they used alcoholic liquors, while 70 per cent admitted using alcohol in excessive quantities;*[3] consequently it becomes very difficult to make deductions as to the exact part played by C O. Since it is a well-known fact, however, that prolonged exposure to carbon monoxide may produce a profound impression on the nervous system, we may regard it as by no means improbable that a part of the sluggish mentality observed among the steel workers may be due to frequent exposure to the gas."

The investigators felt less positive about the muscular deficiency noted. It might be due to the gas, but it might also be due to alcoholism noted above, to venereal disease, of which a surprising amount was discovered, or to unhygienic living. The investigators were medical experts, not social workers. It was their work to find out physical, not social, causes. So a question at once presents itself that the commission did not dwell upon. The men not exposed to gas upon whom strength tests were made were said to be in good hygienic condition—in a better condition, apparently, than those exposed to the gas. Why was this the case? Do blast-furnace workers indulge in more vice and more liquor than others? If so, a condition exists even more serious than gas poisoning. It may not be wholly irrelevant to mention that blast-furnace men—the 240 examined by the commission—were *men who worked 12 hours a day, 7 days a week.*

If such a remark is not irrelevant, may we not direct the attention of the safety committee to hours of labor in general? Hours of labor in the mills of the Illinois Steel Co. are just about the same as in other mills. At South Chicago the Bessemer department and rail mill No. 1 are operated on the three-turn system, and so the men have an 8-hour day. At Gary there are no 8-hour jobs. In both plants molders, machinists, pattern makers, and yard laborers have a 10-hour day. All other departments work 12 hours, and these include a majority of the employees.

There are some peculiar things and possibly a few mitigating circumstances about the hours of labor in the mills of the Illinois Steel Co. Rail mill No. 1 at South Chicago runs on the three-shift plan. Rail mill No. 2 in the same plant operates with two shifts. But rail mill No. 2 makes only light rails. The Gary rail mill, however, is operated in 12-hour shifts, and it makes heavy rails, just as rail mill No. 1 at South Chicago does. This peculiarity is also to be noted in other plants of the Steel Corporation. The Edgar Thomson plant at Braddock, Pa., works its men who make rails 12 hours a day, while the blooming mill rollers have 8 hours.

The plate and structural mills at South Chicago are also run on the two-shift plan, but here enters a mitigating circumstance. There are "spell hands" provided in these mills, and all of the men holding the more arduous positions are, the management states, periodically relieved. In fact, there are practically two men for each position, each working 30 minutes and resting 30 minutes alternately through the day. Thus each man actually works only 6 hours a day, although he is on duty for 12 hours. There are a good many reasons why it is socially bad for a man to remain on duty 12 hours a day whether working all the time or not. He may not have his nose to the grindstone every minute,

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[1] There is not unanimity in the medical profession on this point, but a member of the commission stated that a theory now held is that an excess of red corpuscles may indicate a pathological condition.

[2] The average tests ran as follows for men of ages from 20 to 40 years: For those exposed, 117.13; for the two groups not exposed, 146.11 and 134.43, respectively; for men over 40 the tests for the three groups were, respectively, 94.30, 127.25, and 118.01. In other words, a man of 30 exposed to carbon-monoxide gas is no better man, and possibly not as good, as one 50 years old not so exposed.

[3] Italics are the present writer's.

but his free time is not leisure; nor spent amid surroundings where he can find engagement and refreshment in it. He is no more off duty than a football player waiting for the referee's whistle before resuming play. The same energy and splendid cooperation that have reduced serious accidents 50 per cent could, I am sure, find a way to avoid keeping men on the job 12 hours to do 6 hours' work.

With respect to Sunday work, there is already an intelligent and progressive policy afoot. The welfare committee of the American Iron & Steel Institute has recommended a plan for giving one day of rest in seven to all employees in the continuous 7-day departments. I have received word that this plan has recently been adopted by the Illinois Steel Co. for a tentative trial. To grasp the importance of this change I will describe conditions as they were in February, 1911. The 11 blast furnaces at South Chicago and the 8 at Gary were operated just like all other blast furnaces in America—24 hours a day for 7 days a week. It took about 1,700 men to operate these furnaces, and most of them worked 12 hours a day and 7 days a week. There was some Sunday work in open-hearth furnaces, though it was less than is general among the independent companies. In addition, not less than 600 miscellaneous workmen were required on Sundays for repair work, gas tending, firing boilers, and guarding property in the two big plants. That made a total of over 2,300 who had either a considerable amount of work every Sunday or regular 7-day work, who are now, if I am rightly informed, to be relieved.

I can not believe that a company possessing the wisdom and sense of responsibility manifest in this action will permanently be willing either to favor or apologize for a 12-hour day. Yet that, so far as I could gather, is the position of the operating officials of the Illinois Steel Co. For the evils of a 12-hour day are even greater than the evils of 7-day labor. There is no industry where emergencies do not sometimes arise requiring overtime work. In the steel mills such emergencies often come in rush times, and the 10-hour machinists, electricians, repair men, and laborers become 12-hour men. In such cases also 6-day workmen become for long periods of time 7-day men. And sometimes these emergencies occur even in periods of depression. I met a steel worker on the street of a Pennsylvania mill town last winter at a time when the mills had been for months largely idle and congratulated him on his opportunity to rest.

"Rest!" he yelled at me, "I haven't had a Sunday in five months." He was a repair man. But if overtime oppresses the 10-hour man, what of the workman whose regular hours are 12 in number? Already overworked, an emergency requiring overtime means incredible hardship.

One who had observed carefully social conditions in South Chicago said of the steel workers, "Their day is 12 hours long and complete exhaustion is the inevitable condition." A South Chicago physician told me that the men are overworked and do not get rested from day to day;[1] that the result is an excessive alcoholism and premature breakdown, and yet, as nearly as I could judge, there is less drive in South Chicago than in Pittsburgh.

But whether a man is actually overworked or not, a 12-hour day takes from a community and from the home the time that both have a right to demand from the citizen, and the result is a man handicapped with respect to his duties to everyone, including himself.

Night schools in South Chicago boom when the mills are idle and go to pieces with the return of prosperity. The average man can not hold down a 12-hour job and then spend two hours in study at night. The testimony of night-school teachers is that a man can not be held long after he gets a job in the mills. Library facilities are poor in South Chicago. The Illinois Steel Co. has not yet developed a Carnegie, but there are at least two branches of the Chicago Public Library near the mills, and a settlement in the vicinity has a library from which books may be drawn. But steel workers do not use the books. Many a man gets up at half past 4 in the morning in order to be at the mill at 6. Such a man goes early to bed, even though he has a spell hand, and there is little time for reading.

The libraries are not the only sufferers from the 12-hour day. I met a young married man in South Chicago who had a home indicating taste and refined judgment. He wanted to go down town to theaters and concerts once in a while. He wanted a chance to hear something good sometimes. The nickel theaters near his home did not interest him. But he could satisfy his appetite for good things in music and the drama only by an investment of something of more consequence than the price of seats. He works 12 hours a day—a schedule,

[1] The statements of other South Chicago physicians differed from this judgment.

be told me, "that just allows me time to eat and sleep—no more." This is what he said of it:

"If I want to go to the theater, here is what I am up against. It is just 1 hour and 17 minutes from the time I leave the plant at night that the Illinois Central theater train leaves South Chicago. It takes me 15 minutes to get home on the car after I catch one, but I often have to wait 10 to 20 minutes. Then I've got to wash, change my clothes, and shave, and after that there isn't enough time left to eat a good supper if I'm going to catch that train. It is 12 o'clock midnight or later when we get back home, and I've got to get up again at 4.30 in the morning if I'm going to get to work on time. So you can guess how much I go to the theater."

In the last 10 years the membership in the English-speaking churches of South Chicago has declined, although the number of English-speaking men in the mills has in the same period slightly increased. During the same period the vitality of the churches has at best remained stationary. In some respects it has declined. Ten years ago there was one institutional church maintained in South Chicago. Now there is not even one. A large majority of the pastors of these churches gave as the reason for the lethargy in their churches the 12-hour day and the 7-day week. The testimony was general that such conditions "demoralize our work among the laboring people, for when they have the time or opportunity to participate in religious activities they are so nearly worn out that most of them prefer to remain at home and rest."

To the credit of the pastors of these churches it should be said that they sent a committee to General Manager Field of the south works about two years ago to protest against Sunday work. Mr. Field referred them to men higher in authority, and they went to President Buffington. As a result of their conference the latter is reported to have written to Judge Gary. Undoubtedly this movement of the ministers in South Chicago had an influence in bringing out the now famous order of the Steel Corporation in May, 1910, calling for cessation of unnecessary Sunday work.

Health, hours of labor, Sunday work—these are avenues of opportunity open to the Illinois Steel Co. Some of them they have already recognized. But, as intimated above, there is more than an opportunity here. There is heavy responsibility, and there is no one but the company upon whom this responsibility can lie. The workmen themselves are denied any opportunity to share it and the public has not yet demanded the right to interfere. Indeed it has scarcely interested itself in any way in the behalf of the workers, who can not speak for themselves. The public generally does its work on the other side. When South Chicago citizens thought that new construction had gone to Gary because Public Works Commissioner Patterson enforced the law and would not let the steel company build out into the lake, they went to Springfield 200 strong—business men, lawyers, doctors, and ministers—and lobbied for two weeks for a bill permitting the company for a merely nominal remuneration to fill in along the lake front and make new land. The measure was passed and the delegation of loyal citizens returned to South Chicago rejoicing. The Illinois Steel Co. has a legal department that is perfectly capable of presenting arguments before a legislative committee, or, if pressure of legal business prevents, they have ample means for employing additional counsel to defend their interests. In spite of that these 200 faithful boosters spent their time and their money in the interests of the steel company. It is to be hoped that the company was grateful.

But here is an odd thing. Through all the history of the South Chicago plant no delegation of citizens has ever gone to Springfield to secure legislation for a rest day for the workers. After 29 years, while ministers have sometimes petitioned the company and business men have stood idle, waiting for voluntary action, the company is at last granting a rest day. Nor in 1906, when 46 men were killed in the steel plant, did South Chicago citizens leave their business to demand safety or compensation laws. They waited again for voluntary action, and it came—26 years after the first steel was blown at the South Works. Nor have the citizens of South Chicago ever lobbied at Springfield for an abolition of the 12-hour day, for better housing regulations, improved sanitary conditions, or for any other thing that is vitally connected with the welfare of the 10,000 steel workers who live within their borders. They have waited 30 years for these things and are still waiting. But when it was the interests of the company that seemed to be at stake, they waited only until the legislature met again, and then they literally stormed it—until they got what they wanted.

But it is the steel company that we are considering, not the citizens of South Chicago. The development of safety engineering by the company is a magnificent piece of work. In this departure it does not stand alone, though it has been a pioneer within the corporation. The work of accident prevention, the hospital system, and the plan of paying a fixed compensation to injured men, all together constitute a policy within the United States Steel Corporation that is admirable.

But will the Illinois Steel Co. stop here? A pioneer in safety work, the way is open to it as a pioneer in the work for industrial health. The report of the Illinois commission on industrial diseases showed that certain forms of disease no less than accidents constitute a just charge upon industry. And this was a report that just barely crossed the borders of the field of which it treated. It is so new a field here in America that no one knows how far it extends. It is thought by many that when this field shall have been fully explored it will prove to contain greater need for human conservation than ever did the industrial-accident field.

If the Illinois Steel Co. has reserves of courage and determination, it will explore this field. It will find out the effects on the physical system of long hours of steady work, and it will study the question of vice and alcoholism among men who are kept on duty 12 hours a day and who do not work all of those hours. It will find out more about gas poisoning, and it will consider the effect of heat on heart action. And if the Illinois Steel Co. does all this, there will follow a new movement for health that will be comparable to the safety movement and will be, perhaps, even further reaching.

Ten years ago last summer there was a blast-furnace explosion at South Chicago. It killed one man and severely injured several. But the Chicago newspapers were unable to print the facts just as they were because the steel company would not let them. Not only were the reporters barred from the mill yard, but the police and fire departments were kept outside. Finally, the general manager gave in to the extent of letting one police captain and one fire captain into the plant and to let himself be interviewed by the newspaper men. Even then he refused to disclose the names of the men injured.

"You may say that they were not badly hurt," he said; "we will take good care of them."[1]

Last winter there was a not altogether dissimilar accident at South Chicago, in which one man was killed and several injured. But this time there was no secrecy, no attempt at concealment, no refusal for information. The names and addresses of all the men hurt were in the papers next day, together with the story of the accident. What the public was given to understand 10 years ago to be none of its business it now considers very emphatically a part of its business; and steel managers recognize that claim. Equally radical has been the change in attitude toward the accidents themselves, their preventability, and toward the social and economic issues involved. It has been a change as great as the changes that have swept processes out of existence; as have lifted, and stretched, and revolutionized the great plants themselves.

No company ever had such a chance to make a new record, not in output and costs alone, but in human well-being, as the Illinois Steel Co. has at Gary. New plant, new crews, new managers, no heritage of distrust, no remembrances of petty tyrannies, no dark history of strikes or of violence—it is an opportunity of a century. There have been mistakes, but that opportunity is still, most of it, there.

In only lesser degree is this opportunity true at the rehabilitated South Chicago works. And in the cheerful optimism of the very name under which the campaign against death and injury is waged—the "safety boosting"—we have a presage of what its logical sequence may mean if the conservation of the health of steel workers makes headway in the next 10 years comparable to the change of front as to accidents in the last 10.

[Bulletin No. 1, October 1, 1910.]

United States Steel Corporation committee of safety.

Committee of safety of United States Steel Corporation and subsidiary companies.—Charles MacVeagh, chairman, general solicitor, United States Steel Corporation; C. L. Close, National Tube Co.; F. B. Dodge, Tennessee Coal,

[1] Chicago Record-Herald, July 2, 1901.

Iron & Railroad Co.; S. W. Tener, American Steel & Wire Co.; E. H. Windom, Oliver Iron Mining Co.; R. J. Young, Illinois Steel Co.; W. W. Corlett, secretary.

THE COMMITTEE OF SAFETY.

On March 28, 1908, the general solicitor of the United States Steel Corporation and of its susidiary companies called a meeting of the casualty managers of the subsidiary companies to be held at his office on April 9 and 10 for the purpose of considering the results of the attempts which had been already made to prevent accidents and of considering and formulating further plans for the preventoin of accidents and safeguarding employees. Judge Elbert H. Gary, chairman of the board of directors of the United States Steel Corporation, gave his hearty indorsement of the purposes of the meeting, as follows:

"Some of the gentlemen present, if not all of them, know that I am in hearty sympathy with the movement. We should like to take a prominent part, a leading part, in any movement and in every movement that is calculated to protect employees of the different corporations in which we are interested, and any requisition which is made for the expenditure of money to install equipment to protect our people will be honored. And I do not hesitate to say that we expect our legal departments and the gentlemen who are subject to their control and direction and advice to take such steps as are practicable to ascertain everything that can possibly be done at every locality and in every department to add to the safety of our equipment and to prevent accidents. Upon the ascertainment of the facts which enable the heads of departments to form an intelligment judgment we should be glad to have recommendations made, so that we shall have an opportunity of finally passing upon the question involved. But there is not any doubt that our corporation will promptly and fully approve every suggestion that is made for the betterment of the conditions in this respect, provided the recommendations seem to be practicabe, if the only question involved is the question of dollars and cents; that is to say, we will not hesitate to make the necessary appropriations in money to carry into effect every suggestion that seems to us to be practicable for the improvement of the conditions at our mills, so far as the question of taking care of our employees is concerned."

The result of this meeting was the appointment of a committee of safety to perfect a plan for inspecting the different plants and works of the subsidiary companies with reference to the best methods of preventing accidents and safeguarding employees. In addition the committee was to act as a clearing house in obtaining and disseminating information and suggestions tending toward the prevetion of accidents and the safeguarding of employees. The committee was given power to select inspectors to make written reports of the conditions at the different plants and works with reference to their methods of preventing accidents and to make suggestions for further means for better safeguarding of workmen. After the receipt of such report and recommendations the committee was authorized to transmit them to the proper representatives of the companies concerned requesting these persons to submit, within such time as the committee might fix, returns showing what action had been taken upon such reports and recommendations.

This committee put into operation immediately a system of inspection, selecting men familiar with the machinery and operations of the different subsidiary companies and sending them to inspect the mills and plants. These inspectors are also men of experience in matters connected with accidents, competent to detect sources of danger and able to devise means of avoidance. They report directly to the safety committee. Their reports are exhaustive, taking up each building in the plant and covering it in detail. They call attention even to the smallest sources of danger—worn floors, material piled carelessly, and windows that should be cleaned to give better light; their comments cover even loose planks that workmen have left where they might fall. Railings, ladders, footwalks, and set screws are given the most careful scrutiny. Their reports and recommendations are gone over with care by the safety committee and then are sent to the proper representatives of the company operating the plant in question. The committee requests the company to submit, within 30 days, a return showing what action has been taken to carry out the recommendations of the inspector; or, if objections are made to any recommendations, on what grounds. At the next meeting of the safety committee these returns are taken up and discussed in detail. Where objections have been made to any recommendations and the reason for such objections does not seem sufficient to the committee the representative of the company concerned is

requested to appear and explain the matter. Whenever it seems necessary the committee, or one or more members delegated for that purpose, makes a personal inspection of the plant with regard to any points in dispute.

92 PER CENT ACCEPTED.

In two years the committee has had 78 of the largest plants thoroughly inspected. It has received and considered no less than 5,200 recommendations made by the inspectors. More than 92 per cent of these recommendations were accepted and complied with by the companies interested. Less than 8 per cent required any additional discussion.

In fulfillment of its further purpose as a clearing house for information of value in the prevention of accidents the committee during this time has received from the different subsidiary companies more than 75 suggestions of plans of new devices and appliances for safeguarding machinery, warning employees, and otherwise preventing accidents. These suggestions often come in the form of letters stating the experience of the several subsidiary companies in connection with different kinds of accidents due to causes which might exist in other plants. These letters report various kinds of guards for machinery which have been found effective, and are accompanied by blue prints, photographs, estimates of cost, and all information necessary to all the companies where similar conditions exist, with recommendations from the committee regarding the different suggestions. By subsequent inspections the committee is enabled to tell how fully these different devices have been adopted.

STANDARDIZATION OF SAFETY APPLIANCES.

The safety committee now is endeavoring to standardize those safety devices which are in use upon machinery common to a large number of the different plants. Heretofore each subsidiary company has worked out its own method of guarding flywheels, gears, electric switchboards, and similar sources of danger which exist in all large mills. An endeavor is being made to determine from among the different methods in use to meet certain common sources of danger which are the most effective and should be adopted by all mills and plants of the United States Steel Corporation and its subsidiary companies. It is hoped thus to insure the use of only the most improved and effective safeguards and, by familiarizing the superintendents and foremen with these safeguards, to bring about their ready adoption everywhere.

It is for this purpose that the committee has brought together in this pamphlet for distribution among all the plants a few of the safety devices approved by the committee, and it is hoped to follow it from time to time with additional publications on the same line.

[Bulletin No. 2, July 1, 1911.]

United States Steel Corporation committee of safety.

Committee of safety of United States Steel Corporation and subsidiary companies, July 1, 1911.—Charles MacVeagh, chairman, general solicitor, United States Steel Corporation; G. M. Cooper, American Bridge Co., American Bridge Co. of New York, American Sheet & Tin Plate Co.; F. B. Dodge, Tennessee Coal, Iron & Railroad Co.; Thomas Ewing, National Tube Co.; G. K. Preston, Carnegie Steel Co.; S. W. Tener, American Steel & Wire Co.; E. H. Windom, Oliver Iron Mining Co.; R J. Young, Illinois Steel Co.; C. L. Close, secretary.

THE SAFETY COMMITTEE.

Bulletin No. 1, issued by the safety committee on October 1, 1910, contained a brief statement of the origin and organization of the United States Steel Corporation committee of safety. The success of the work undertaken by this committee led to a large increase in its work and its usefulness. Three years' experience has led to some changes in the organization of the committee which are expected to increase its effectiveness. The number of the committee has been increased from five to seven members, in order that a majority of the operating subsidiary companies may be represented. Mr. C. L. Close, who formerly represented the National Tube Co. upon the committee, has now been transferred to the service of the United States Steel Corporation and attached

to the general solicitor's office to assist in the administrative details of the safety committee, both in the work of accident prevention and in the administration of the voluntary accident relief plan. Mr. Close acts as secretary of the committee. The meetings of the committee are now held quarterly in the third weeks of February, May, August, and November.

The functions of the committee continue the same as they have been heretofore, but are now carried out more fully than was originally possible. They are as follows:

(1) The committee conducts thorough inspections of all plants of all subsidiary companies from the standpoint of safety. These inspections are in addition to those made by the companies themselves and are conducted by inspectors selected from companies other than those operating the plants in question. These inspectors report and are responsible to the safety committee, and not to the companies whose plants are under inspection. From time to time, and whenever special circumstances seem to require such action, the committee, or various members thereof, make these inspections themselves.

(2) The committee acts as a clearing house for all information relating to the safety of employees. All safety devices and other methods of increasing the safety of the workmen and of interesting the men in their own safety and that of their fellow workmen, are reported to the committee by the subsidiary companies in which they originate. These safety methods and devices are carefully considered by the committee, and if approved are recommended to all the subsidiary companies often with improvements suggested by the committee. In this manner descriptions with full details, photographs, diagrams, and complete information of all matters dealing with the safety of employees is disseminated among the subsidiary companies.

(3) The committee at its quarterly meetings considers all serious accidents which have occurred in any of the companies during the preceding quarter, with a view to devising means for preventing the recurrence of similar accidents.

(4) In addition to its work for the prevention of accidents the committee assists in the administration of the voluntary accident relief plan, and considers any questions of general character which arise in the administration of the plan.

By action of the finance committee of the United States Steel Corporation on May 2, 1911, a continuance of the voluntary accident relief plan for another year from May 1, 1911, was approved. The plan as thus continued in operation has not been modified in any essential particular from the form in which it was first put into operation on May 1, 1910. In fact, it has not been changed at all from the manner in which it has been administered during the first year of its operation, but a few minor changes have been made in order to make clear what was actually being done in its administration. A copy of this plan is printed at the end of this bulletin.

PLANT SAFETY COMMITTEES.

Safety committees have been organized in almost all the plants of the subsidiary companies. The organizations differ somewhat in the several companies, but the plan usually followed is to have what is called a "permanent committee" or "central committee," also a "workmen's committee." The "permanent committee" is made up of superintendents, master mechanics, and heads of departments, and reports directly to the manager of the plant. The "workmen's committee" usually consists of three members and is made up from the rank and file of the mill. The members of the committee are allowed sufficient time once or twice a month, or even as often as once a week in some plants, to make an inspection of the plant, which may require from a few hours to a whole day, according to the size of the plant. Workmen are paid their regular rate of wages while on this work.

The duty of these committees is to look for defects in buildings or equipment, unsafe practices by the workmen in doing their work, and any other conditions in the plant which might be the cause of accidents. After each inspection they report in writing to the manager such matters as need attention, with such recommendations as, in their opinion, will prevent accidents.

In some of the plants these recommendations are passed upon by the "permanent committee," and then sent to the manager of the plant for the proper authority to carry out the suggestions.

The make-up of these committees is changed frequently, with the result that in time every man in the mill will have been a member of one of these committees. The men are made to understand that after they have served their time upon the committee they should not drop the work, but continue to mak

suggestions. A good many suggestions come from ex-members of these committees.

Other duties of the committees are to investigate all serious accidents. In making this investigation they go to the scene of the accident, examine witnesses, when necessary, and make a report as to what they think can be done to prevent a similar accident; also whether, in their opinion, anyone was negligent, and what they think should be done with the negligent person. Careless men are laid off or discharged through the recommendation of these committees.

These safety committees are accomplishing very good work in the mills and are causing the men to take more interest in their own safety and that of others.

This bulletin shows a number of views of saftey devices approved by the United States Steel Corporation safety committee. Several designs of guards to be used for the same purpose are shown, with the idea of giving a choice of designs if any one does not suit local conditions.

United States Steel Corporation voluntary accident relief plan (May 1, 1911).

[Provided by subsidiary companies for employees injured and the families of employees killed in work accidents.]

ACCIDENT RELIEF.

1. This plan of relief is a purely voluntary provision made by the company for the benefit of employees injured and the families of employees killed in the service of the company, and constitutes no contract and confers no right of action. The entire amount of money required to carry out the plan will be provided by the company, with no contribution whatsoever from the employees.

2. Where the word "manager" appears in this plan of relief it means that official of the company who has charge of this relief for his company.

3. The decision of the manager of this relief shall be final with respect to all questions arising under this plan of relief, and he shall have full discretionary power in paying relief to meet any conditions which may arise and may not be covered by this statement.

4. The privilege of this relief will take effect as soon as an employee enters the service of the company, will continue so long as the plan remains in operation during such service, and will terminate when he leaves the service.

5. Payment of this relief will be made only for disablement which has been caused solely by accidents to employees during and in direct and proper connection with the performance of duties to which the employees are assigned in the service of the company, or which they are directed to perform by proper authority, or from accidents which occur in voluntarily protecting the company's property or interests. Relief will not be paid unless investigation of the causes and circumstances of the injury shows that it was accidentally inflicted and that it renders the employee unable to perform his duties in the service of the company or in any other occupation.

6. No relief will be paid for the first 10 days of disablement.

7. No employee will be entitled to receive relief except for the time during which the surgeon certifies that he is unable to follow his usual or any other occupation.

8. Employees will not be entitled to receive disablement relief for any time for which wages are paid them.

9. The company will provide treatment by surgeons and hospitals of its selection.

10. The company will furnish artificial limbs and trusses in cases where these are needed.

11. All men injured in the service of the company must obey the surgeon's instructions in reporting for examination, using the remedies and following the treatment prescribed, and going to the hospital if directed. No relief will be paid unless these instructions are obeyed. All employees who are disabled but not confined to the house must report in person at the surgeon's office from time to time, as reasonably requested, and must keep any other appointments made by the surgeon.

12. All employees who wish, while disabled, to go away from their usual place of residence, must first arrange with their employing officer and with the

surgeon in charge as to the absence and the evidence of continued disablement to be furnished. Such employees must report as often and in such manner as may be required of them.

13. Where it is shown to the satisfaction of the manager that single men contribute regularly to the support of actual dependents, the manager shall have authority to fix the amount of relief, within the limits of relief for married men.

14. No relief will be paid to any employee or his family if suit is brought against the company. In no case whatsoever will the company deal with an attorney or with anyone except the injured man or some member of his family in the matter of relief to be paid under this plan, because it is part of the plan that the whole amount paid shall be received by the employee and his family.

15. No relief will be paid for injuries caused or contributed to by the intoxication of the employee injured or his use of stimulants or narcotics or his taking part in any illegal or immoral acts.

16. All employees of the company who accept and receive any of this relief will be required to sign a release to the company.

17. Whenever the persons entitled to receive any lump sum so consent the relief will be paid to a savings bank or trust company to be held at interest and paid over to the persons entitled to it in such installments as may be agreed upon. This is earnestly recommended in all cases.

TEMPORARY DISABLEMENT.

18. Under the terms and conditions stated here, employees shall be entitled to the following temporary disablement relief, but no such relief will be paid for the first 10 days nor for longer than 52 weeks:

Single men.—Single men who have been five years or less in the service of the company shall receive 35 per cent of the daily wages they were receiving at the time of the accident. Single men of more than five years' service shall receive an additional 2 per cent for each year of service over five years. But in no case shall single men receive more than $1.50 per day.

Married men.—Married men living with their families who have been in the service of the company five years or less shall receive 50 per cent of the daily wages they were receiving at the time of the accident. For each additional year of service above five years 2 per cent shall be added to the relief. For each child under 16 years 5 per cent shall be added to the relief. But in no case shall this relief exceed $2.50 per day for married men. Married men not living with their families shall be classed as single men.

PERMANENT DISABLEMENT.

19. The amount of relief which will be paid to employees who have sustained some permanent disablement, such as the loss of an arm or leg, will depend upon the extent to which such disablement renders it difficult for them to obtain employment. The kinds of disablement that may occur and the extent to which each interferes with employment differ so greatly that it is impossible to provide any adequate schedule of relief which will be paid in all cases of permanent disablement. The amounts which will be paid in cases not specifically mentioned here must of necessity be left to the discretion of the manager; but it is the intention of the company that this discretion shall be so exercised in all cases as to afford substantial relief corresponding as far as possible with the amounts stated below, considering the special circumstances of each case and the character and extent of the injury.

(*a*) For the loss of a hand, 12 months' wages.
(*b*) For the loss of an arm, 18 months' wages.
(*c*) For the loss of a foot, 9 months' wages.
(*d*) For the loss of a leg, 12 months' wages.
(*e*) For the loss of one eye, 6 months' wages.
(*f*) For permanent total disablement, such amount as shall be required in the judgment of the manager to make suitable provision for the injured man, but in no case less than the death relief for such a man.

Loss of both hands, feet, or eyes, or of any two of these members, shall be classed as permanent total disablement.

DEATH.

20. Relief for the families of employees killed in accidents which happen in the work of the company will be paid only where the death of the employee is

shown to have resulted from an accident (or sunstroke or heat exhaustion) in the work of the company during and in direct and proper connection with the performance of duties to which the employee had been assigned in the service of the company or which he had been directed to perform by proper authority, or from accidents which occur in voluntarily protecting the company's property or interests.

21. Death relief will be paid as soon as possible after the required proof of cause of death is obtained and a satisfactory release given.

22. The company will pay reasonable funeral expenses, not to exceed $100.

23. No relief will be paid for death caused or contributed to by the intoxication of the employee killed or his use of stimulants or narcotics or his taking part in any illegal or immoral acts.

24. No relief will be paid to the family of any employee if suit is brought against the company.

25. Under the terms and conditions stated here, the widows and children of employees killed in accidents which happen in the work of the company shall be entitled to the following death relief:

In the case of married men living with their families, who have been in the service of the company five years or less and leave widows or children under 16 years of age, the company will pay relief to an amount equal to 18 months' wages of the deceased employee. For each additional year of service above five years, 3 per cent shall be added to this relief. For each child under 16 years, 10 per cent shall be added to this relief.

But in no case shall this death relief exceed $3,000.

26. This plan of relief will be continued in operation for one year from May 1, 1911, but may be modified to conform to any statutory plans.

United States Steel and Carnegie pension fund, operative January 1, 1911, and applicable to employees of the United States Steel Corporation and subsidiary companies.

GENERAL NOTICE TO EMPLOYEES.

The United States Steel and Carnegie pension fund was established in the year 1910 by the joint action of the United States Steel Corporation and Andrew Carnegie. Its purpose is the payment to employees of old age pensions from the income of the fund. For this purpose the United States Steel Corporation provided $8,000,000, which, with the Carnegie relief fund of $4,000,000, created by Andrew Carnegie on March 12, 1901, makes up a joint fund of $12,000,000.

This pension fund is administered by a board of 12 trustees through a manager appointed by the board, with such powers and duties as may be given him by the board.

The pension rules are established by resolution of the board of trustees and apply to all employees in the service of the United States Steel Corporation, or of any company owned or controlled by it on January 1, 1911, or thereafter.

PENSION RULES.

WHO MAY OBTAIN PENSIONS.

Class 1.—Pensions by compulsory retirement.—All men who have been 20 years or longer in the service and have reached the age of 70 years shall be retired and pensioned.

All women who have been 20 years or longer in the service and have reached the age of 60 years shall be retired and pensioned.

Class 2.—Pensions by retirement at request.—Any man who has been 20 years or longer in the service and has reached the age of 60 years may be retired and pensioned either at his own request or at the request of his employing officer.

Any woman who has been 20 years or longer in the service and has reached the age of 50 years may be retired and pensioned either at her own request or at the request of her employing officer.

Class 3.—Pensions for permanent incapacity.—Any employee who has been 20 years or longer in the service and has become permanently totally incapacitated through no fault of his or her own, as a result of sickness or injuries received while not on duty, may be pensioned at the discretion of the board of trustees.

AMOUNT OF PENSIONS.

Rate.—For each year of service 1 per cent of the average regular monthly pay received during the last 10 years of service.

Maximum and minimum amounts.—No pension will be more than $100 a month or less than $12 a month.

HOW TO OBTAIN PENSIONS.

Class 1 cases.—Employing officer will notify employee of the date on which employee will be retired and report case to the manager of the fund.

Class 2 cases.—Employee may apply to employing officer to be retired, or employing officer may notify employee that he wishes employee to be retired, and in either event employing officer will report case to the manager.

Class 3 cases.—Employee may apply to employing officer, who will report case to the manager.

Every pension report will be sent to the president of the employing company for his approval.

WHEN AND HOW PENSIONS ARE PAID.

Pensions will be paid monthly, at the close of each month, beginning with the month fixed by the board and ceasing with the month succeeding that in which the death of the retired employee occurs.

GENERAL INFORMATION.

The service for which an employee shall receive credit is that which he has rendered, continuously, to the United States Steel Corporation, or to one or more companies a majority of whose stock is owned or controlled by it, and to their predecessors.

Employees who leave the service or are discharged thereby forfeit the years of service then to their credit and their privileges under the pension rules unless reinstated within two years. Time thus lost will be deducted in reckoning the length of service.

Lay off for less than six months on account of leave of absence, suspension, reduction in force, or disability will not be deducted in reckoning length of service; but if such lay off continues longer than six months, without an extension of time granted by his employing officer, the employee will be considered to have left the service. He can be reinstated if he returns to work within two years; but time thus lost will be deducted. Employees on lay off must return to work as soon as possible, or if unable to do so should apply within six months for an extension of time.

These rules will be applied in reckoning service rendered prior to January 1, 1911, and thereafter.

An employee placed upon the pension list must retire from and can not reenter the service, but may engage in other business so long as such other business is not of the same character as his former employment.

A pension may be withheld or terminated in case of misconduct on the part of the beneficiary or for other cause, sufficient in the judgment of the board, to warrant such action.

No employee has any legal right to a pension and the pension rules do not confer upon any employee any right to be retained in the service.

Pensions are not subject to attachment for debts; neither will any assignment of pensions be permitted or recognized under any circumstances.

All questions arising out of the administration of the fund and relating to employees will be decided by the manager; but employees have the right of appeal to the board of trustees within 30 days after receipt of notice of the manager's decision.

A report giving an account of the fund and its administration will be made annually and will be published and posted.

The full text of the pension rules, in pamphlet form, will be furnished by employing officers upon request.

By order of the pension committee.

J. B. ERSKINE,
Manager, Oliver Building, Pittsburgh, Pa.

JANUARY 1, 1911.

NEW YORK, *December 31, 1902.*

To the officers and employees of the United States Steel Corporation and of its subsidiary companies:

GENTLEMEN: For several months the finance committee has been engaged in perfecting a plan which, in its opinion, would make it your common interest to become permanent holders of the preferred stock of the corporation.

From the earnings of the corporation during the year 1902 there will have been set aside at least $2,000,000, and as much more as is necessary, for the purchase of at least 25,000 shares of the corporation's preferred stock for the purpose of making the following offer to all the employees of the Steel Corporation and of its subsidiary companies:

At the present time there are in the service of the corporation, and of its subsidiary companies, about 168,000 employees, whom we propose now to divide into six classes, as follows:

Class A will include all those who receive salaries of $20,000 a year or over.

Class B will include al those who receive saaries of from $10,000 to $20,000 a year.

Cass C will include all those who receive salaries of from $5,000 to $10,000 a year.

Class D will include all those who receive salaries of from $2,500 to $5,000 a year.

Cass E will include all those who receive salaries of from $800 to $2,500 a year.

Cass F will include all those who receive salaries of $800 a year or less.

During the month of January, 1903, the above-mentioned stock will be offered to any and every man in the employ of the corporation, of any of its subsidiary companies, at the price of $82.50 per share; subscriptions for this stock to be made on blanks obtainable at the office of the treasurer of any subsidiary company.

Every man can subscribe for as much stock as he chooses, not to exceed the sum represented by a certain percentage of his annual salary, as indicated in the following table:

Any man who belongs in Class A, as indicated in the preceding classification, will be allowed to subscribe for an amount of stock represented by a sum not to exceed 5 per cent of his annual salary.

Class B, 8 per cent.

Class C, 10 per cent.

Class D, 12 per cent.

Class E, 15 per cent.

Class F, 20 per cent.

If, on this basis of subscription, more than 25,000 shares shall be subscribed for, 25,000 shares will be awarded to the several subscribers in the order of the classes, beginning with the lowest or class F, the upper classes to receive only in case any stock shall remain untaken by the class below, and each class to receive ratably in the amount left for that class if there be not enough to satisfy the full subscription of that class, but each subscriber will be allotted at least one full share, even though this might make it necessary for the finance committee to purchase more than 25,000 shares.

Payment of the subscriptions for the stock must be made in monthly installments, to be deducted from the salary or wages of the subscriber, in such amounts as he may desire, not to exceed 25 per cent of any one month's salary or wages.

A man may take as long as he chooses, not exceeding three years, to pay for his stock.

Dividends on the stock will go to the subscriber from the date on which he commences to make payments on account of his subscription.

Interest at 5 per cent will be charged on deferred payments on the stock.

In case a man shall discontinue payments before his stock shall have been fully paid for, he can withdraw the money he has paid on account of principal and may keep the difference between the 5 per cent interest he has paid and the 7 per cent dividend he has received on the stock; and thereupon his subscription and all interest on the stock to which the same relates shall cease and determine.

As soon as the stock shall have been fully paid for it will be issued in the name of the original subscriber and the certificate will be given to him, and he can then sell it any time he chooses. But as an inducement for him to keep 't and to remain continuously in the employ of the corporation or of one or

another of the subsidiary companies, and to have the same interest in the business that a stockholder or working partner would have, the following offer is made, viz:

If he will not sell or part with the stock, but will keep it and in January of each year, for five years, commencing with January, 1904, will exhibit the certificate to the treasurer of his company, together with a letter from a proper official, to the effect that he has been continuously in the employ of the corporation or of one or another of its subsidiary companies during the preceding year, and has shown a proper interest in its welfare and progress, he will, during each of such five years, receive checks at the rate of $5 a share per year. For example: If a man buys one share of this stock in January, 1903, he will undertake to pay $82.50 for it. If, after paying for it, he keeps it for five years he will in each year have received dividends at the rate of 7 per cent on the par value of the stock, and also will have received each year an extra dividend, so to speak, of $5; this latter sum being paid him as special compensation for rendering continuous faithful service to the corporation or to one or another of its subsidiary companies, as shown by the exhibition of his certificate, together with a letter from a proper official, showing that he has worked to promote the best interests of the company in which he has thus become practically a partner.

If he shall remain continuously in the service of the corporation or of one or another of its subsidiary companies for five years, at the end of the fifth year the corporation intends that he shall receive a still further dividend, which can not now be ascertained or stated, but which will be derived from the following source, viz:

All who subscribe for stock in January, 1903, and commence to pay for it, but who discontinue at any time during the five years, of course, will not receive the $5 per share for such of the five years as remain after they discontinue. The corporation will, however, pay into a special fund each year the $5 payments that would have been made to such subscribers had they continued. This fund shall be credited with 5 per cent annual interest, and at the end of five years' period the total amount thus accumulated will be divided into as many parts as shall be equal to the number of shares then remaining in the hands of men who shall have continued in such employ for the whole five years, and the corporation will then, by its own final determination, award to each man whom it shall find deserving thereof as many parts of such accumulated funds as shall be equal to the number of shares then held by him under this plan:

Provided, however, that if a subscriber shall have died or shall have become disabled while faithfully serving the corporation or one or another of its subsidiary companies, during such five years' period, the money theretofore paid by him on account of the stock he was purchasing, or, if he has fully paid for it, the certificate of stock may be turned over by the corporation to his estate or to him, together with a sum equal to $5 per share for each of the five years not then expired.

If this plan shall be received favorably and shall meet with success, it is intended, at the close of next year, to make a similar offer, excepting, of course, that the price at which the stock then will be offered can not be guaranteed now; it is, however, the intention to offer it at about the then market price, and in all other respects to make the terms of the offer similar to those now submitted.

The continuation of this policy would make it possible for a man to buy one or more shares of the stock each year under a contract with the corporation upon terms offering a safer and more profitable investment than he could possibly find for his savings anywhere else.

By order of the finance committee.

UNITED STATES STEEL CORPORATION.
GEORGE W. PERKINS, *Chairman.*

UNITED STATES STEEL CORPORATION,
New York, January 2, 1912.

To the officers and employees of the United States Steel Corporation and of its subsidiary companies.

GENTLEMEN: Annually for the past nine years the corporation has offered to its officers and employees and to the officers and employees of its subsidiary companies the privilege of subscribing for a specified number of shares of its

stock under certain terms and conditions. The corporation now offers to such officers and employees the opportunity to subscribe for shares of its preferred or common stock at the price of $110 per share for the former and $65 per share for the latter, subject to the following conditions:

First. All subscriptions shall be made with the express understanding that the decision of the finance committee of the United States Steel Corporation at all times shall be final with respect to the rights or interests of the subscribers, or any question relating to the same.

Second. All subscriptions shall be for one or more shares of preferred or common stock at the subscription price of $110 per share for preferred stock, or $65 per share for common stock, with the understanding that there may be allotted to the subscriber all or any part of his subscription, as such finance committee may determine. No subscription will be received for a combination of both preferred and common stock.

Third. The following table shows the maximum number of shares which may be subscribed for, in accordance with the preceding section, by employees whose salaries or wages are within the respective limits stated, but an employee of any class may subscribe for one or more shares up to the maximum he is entitled to:

SUBSCRIPTIONS TO PREFERRED STOCK.

Employees receiving annual salaries of:	Shares.
$1,100 or less	1
$1,100.01 to $1,833.33	2
$1,833.34 to $3,208.33	3
$3,208.34 to $4,125	4
$4,125.01 to $6,050	5
$6,050.01 to $7,150	6
$7,150.01 to $8,250	7
$8,250.01 to $9,350	8
$9,350.01 to $13,062.50	9
$13,062.51 to $14,437.50	10
$14,437.51 to $15,812.50	11
$15,812.51 to $17,187.50	12
$17,187.51 to $18,562.50	13
$18,562.51 to $19,937.50	14
$19,937.51 to $34,100	15

SUBSCRIPTIONS TO COMMON STOCK.

Employees receiving annual salaries of:	Shares.
$487.50 or less	1
$487.51 to $1,083.33	2
$1,083.34 to $1,516.66	3
$1,516.67 to $1,950	4
$1,950.01 to $2,383.33	5
$2,383.34 to $3,520.83	6
$3,520.84 to $4,062.50	7
$4,062.51 to $4,604.16	8
$4,604.17 to $6,175	9
$6,175.01 to $6,825	10
$6,825.01 to $7,475	11
$7,475.01 to $8,125	12
$8,125.01 to $8,775	13
$8,775.01 to $9,425	14
$9,425.01 to $12,593.75	15
$12,593.76 to $13,406.25	16
$13,406.26 to $14,218.75	17
$14,218.76 to $15,031.25	18
$15,031.26 to $15,843.75	19
$15,843.76 to $16,656.25	20
$16,656.26 to $17,468.75	21
$17,468.76 to $18,281.25	22
$18,281.26 to $19,093.75	23
$19,093.76 to $19,906.25	24
$19,906.26 to $33,150	25

Fourth. Payment of the subscriptions shall be in monthly installments, to be deducted from the salary or wages of the subscriber, in such amounts as he may wish, subject to the provision that the minimum amount of a monthly installment shall be $2.50 per share for preferred stock and $1.50 per share for common stock, and that no installment shall exceed 25 per cent of any one month's salary or wages. It is hoped that subscribers will pay their installments in even dollars, but if more than the minimum is paid it must be in even dollars. The stock must be paid for within three years. Interest at 5 per cent per annum will be charged on deferred payments on the stock.

Fifth. From the date on which payments begin and during the continuation of such payments the dividends paid on the stock will be credited to the account of the subscriber as part of his payments until the stock is fully paid and issued to him, after which dividends will be paid to him as to other stockholders.

Sixth. Subscriptions will be canceled—

(a) At the request of the subscriber.

(b) By leaving the service or failing to resume employment when requested (see sec. 11).

(c) Whenever payments on account of subscription shall have been discontinued without the consent of the corporation for a period of three months.

Thereupon, the subscription and all interest in the stock to which the same relates shall be terminated and there will be returned to the subscriber the exact amount of his payments made on account, with interest at 5 per cent per annum on the same from time of payment, no credit being given him for dividends or for the special allowance referred to in third paragraph of section 7, and no interest being charged on deferred payments.

A subscriber who cancels his subscription must cancel all of it.

Seventh. When the stock is fully paid for, it will be issued in the name of the subscriber. He may sell his certificate whenever he chooses, but as an inducement for him to keep it while he remains in the service the following offer is made, viz:

If he will keep the stock and in January of each year, for five years, commencing with January, 1913, will exhibit the certificate to the treasurer of his company, together with a statement from a proper official that he has been continuously in the employ of the corporation or of one or another of its subsidiary companies during the preceding year, and has shown a proper interest in its welfare and progress, he will for each five years receive a cash payment at the rate of $5 a share for each share of preferred stock, and $3.50 a share for each share of common stock.

Subscribers who may not have fully paid their subscriptions by January in any year, will, if their subscriptions are still in force, and they have otherwise fulfilled all the conditions of continuous and faithful service as provided, be credited in their subscription accounts with the special allowance of $5 per share on their subscriptions for preferred stock, and $3.50 per share on their subscriptions for common stock.

Eighth. If a subscriber keeps his certificate and remains continuously in the service for five years, the corporation intends that he shall then receive a still further compensation, which can not now be ascertained or stated, but which will be derived from the following sources, viz:

The special allowances referred to in section 7 which are forfeited by—

(a) Cancellation of subscription;

(b) Transfer of certificate from name of subscriber, whether intentionally or otherwise;

(c) Leaving the service, or failing to resume employment when requested (see sec. 11)

will be paid by the corporation into a special fund at the end of each year. This fund will be credited with interest at 5 per cent and at the end of the five-years period the total amount thus accumulated will be divided into as many parts as shall be equal to the number of shares of preferred stock plus seven-tenths of the number of shares of common stock then remaining in the hands of subscribers who shall have continued in such employ for the whole five years. The corporation will then by its own final determination award to each subscriber whom it shall find deserving thereof as many parts of such accumulated fund as he shall be entitled to on basis of the number of shares then held by him under this plan, i. e., one part for each share of preferred and seven-tenths of one part for each share of common.

Ninth. In case a subscriber dies or becomes permanently disabled while faithfully serving the corporation or one of its subsidiary companies during such five-year period, payments will be made to his estate or to him as follows:

(*a*) If his subscription is fully paid and he has received and not disposed of his certificate of stock, the corporation will pay, as above stated, a sum equal to $5 or $3.50 per share for each of the five years not then expired, and also a pro rata amount of the special fund arising from forfeitures, referred to in section 8 preceding, which may have accrued at the time of his death or disability.

(*b*) If his subscription has not been paid in full, the corporation will pay, as stated, the money theretofore paid in by him on account, together with the dividends paid on the stock subscribed for, the special compensation for the entire five-year period, and a pro rata share of the amount of the special fund mentioned in paragraph (*a*) preceding, less interest at 5 per cent per annum on deferred installments.

(*c*) If at time of decease or permanent disablement the subscription has been fully paid but certificate not yet delivered, the corporation will turn over the certificate, as first stated above, together with the additional payments as mentioned in paragraph (*a*) preceding.

A pensioner will not be permitted to subscribe, but any employee who subscribes and is subsequently pensioned will at his request be permitted to pay up his subscription on the same terms as if he had remained in the service, provided, however, that as soon as he shall have fully paid his subscription and received his certificate of stock he will be treated as though permanently disabled, and payments will be made to him in accordance with provisions of paragraph (*a*), section 9.

Tenth. A subscriber may designate in his subscription the person to whom in the event of his death he desires the corporation to pay all amounts in connection with his subscription which would otherwise be payable to his estate. When such designation has been made, the corporation, upon satisfactory proof of death under the conditions of the subscription, will pay to the person designated, if then living, all amounts in connection with the subscription which would otherwise be payable to the estate of the subscriber. When such designation has been made the subscriber's estate shall have no claim to any such amounts unless the person designated should die before the subscriber, and in that event payment will be made to the subscriber's estate. By written notice, delivered to the treasurer of the company by which he is employed, a subscriber may change the person designated.

Eleventh. Subscribing employees whose employment has been or may be suspended by reason of the temporary closing of the plants, and who shall continue ready and willing when required to resume their service, will not be deprived of the special allowance of $5 or $3.50 per share per year during such suspension. This need not interfere with their accepting employment elsewhere during such suspension. As presumptive evidence of such willingness to resume their employment the corporation will accept (1) from the holders of fully paid subscriptions the presentation of the original certificate in January of each year, and (2) from the holders of partly paid subscriptions the retention by them of their subscription during the preceding year.

The above period of suspension will not be counted as part of the three years limited for the full payment of the subscriptions, and during such suspension monthly payments will not be required, though, if so desired by the employee, they may be continued.

Failure to present the original certificate as provided, or the withdrawal of a partly paid subscription, or the failure to resume employment when requested, will constitutute a relinquishment of all benefits referred to in this circular.

In case of the death during such suspension of any such subscribing and continuing employee, his estate or his designee, as above, will be entitled to the same benefits accruing to his subscription as if he had died while under employment.

Twelfth. Subscriptions will be received until February 3, 1912, inclusive, and allotment will be made a few days later. The first deductions will be made from February salary or wages.

By order of the finance committee.

UNITED STATES STEEL CORPORATION,
RICHARD TRIMBLE, *Secretary.*

No. 52

UNITED STATES STEEL CORPORATION

HEARINGS

BEFORE THE

COMMITTEE ON INVESTIGATION OF UNITED STATES STEEL CORPORATION

HOUSE OF REPRESENTATIVES

WEDNESDAY, FEBRUARY 28, 1912

WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

UNITED STATES STEEL CORPORATION.

COMMITTEE ON INVESTIGATION OF THE
UNITED STATES STEEL CORPORATION,
HOUSE OF REPRESENTATIVES,
Washington, D. C., Wednesday, February 28, 1912.

The committee this day met, Hon. Augustus O. Stanley (chairman) presiding.

The CHAIRMAN. The committee will come to order.

Mr. YOUNG. Mr. Chairman, I wish to present for insertion in the record certain extracts from the Iron Ore Manual of the Lake Superior District for 1911, by Rukard Hurd. This is a book which we have used in previous hearings, and which has been testified to as being a standard authority in the trade.

The extracts referred to are as follows:

THE MINNESOTA TAX COMMISSION AND ITS VALUATION OF IRON ORE.

(By RUKARD HURD.)

The history of the Lake Superior iron district would not be complete without referring to the Minnesota tax commission, and the manner in which it has accomplished the arduous work of valuing for taxation purposes the greatest known iron-ore deposit in the world, of the Vermilion and Mesabi Ranges, contained within the State of Minnesota and in the counties of St. Louis and Itasca.

The Minnesota tax commission was created by an act of the legislature approved April 23, 1907. On April 27, 1907, the three commissioners were appointed by the governor to serve for two, four, and six year terms, respectively, and on that date qualified, organized, elected a secretary, and were then ready for business. It is a permanent commission, in continuous session, has been granted very broad powers, is maintained by an annual appropriation of $30,000, and obtains such additional extra appropriation upon request as it finds necessary to facilitate its work.

The commission is in sole charge of taxation matters and of tax officials. The commission is practically a court on taxation, and establishes its own procedure; it orders and grants hearings; considers and decides upon all applications for reduction or abatement of taxes; prescribes and publishes taxation blanks and forms; orders reassessments both on its own volition or upon certified official requests, appointing its own special assessors; has authority to call for persons and papers. Finally, the commission is the State board of equalization.

Among the many matters taken under immediate consideration were: First. The determination of the relation of the true to the assessed value of realty prevailing throughout the State by the sales method, which resulted in obtaining for the years 1902–1907, inclusive, a record of 53,010 real estate sales amounting to $98,647,719, the assessed valuation of which for year of transfer was $42,892,017; and

Second. The placing of an ad valorem value on the realty contained within the so-called ore belts of the Vermilion Range in St. Louis County, and the Mesabi Range in St. Louis and Itasca Counties.[1]

[1] From 1881 to 1897 there was a tax of 1 cent per ton on shipments.

The Mesabi Range, after hasty and often unreliable and incomplete exploration, had only been opened and shipping since 1892. For a number of years the value of its grade of iron ore had not been fully commercially determined. The total tonnage was not known and explorations were mainly incomplete and unreliable.

No previous attempt had been made to locate and assess tonnage. Crude methods and arbitrary values were used, based upon previous output, or expected shipments and such fragmentary information as was available. The 1906 realty assessment on the mines amounted to a total of $64,486,409.

The tax commission decided to avoid arbitrary methods and to obtain, if possible, the necessary information on which to base an intelligent, just, and equitable assessment of the mineral properties.

On June 18, 1907, by circular letter, the commission requested all owners and operators of iron ore properties to furnish by July 15, 1907, full information concerning their holdings—tonnages with average analyses, character and structure of the ore, date and term of mining leases and amount of royalty, mining and other cost, average price of their ore for a term of years at lower lake ports, etc.

The commission, with its secretary and the State inspector of mines, then proceeded upon a thorough investigation and inspection of the underground and open-pit mines, of prospects, and of mineral lands on the ranges. It became apparent that many mines were operating under the most favorable conditions and shipping high-grade ore at low cost, while many other mines had a higher cost and lower grade of ore, and many others were mining under adverse conditions, with excessive rock, water, quicksand, and a low grade of ore. Many mines had ore beginning at the surface; others would have 50 to 100 feet of overburden, containing many millions of cubic yards that must be removed at great cost prior to open-pit mining; while others, on account of overburden, could be operated only as underground mines.

The commission grasped the situation and evolved the unprecedented plan of placing an ad valorem value on and taxing iron ore in the ground and by the ton.

Taking the Hull-Rust and the Mahoning mines as models or standards for the highest type of mining of high-grade ore under the most favorable conditions and at the minimum cost, by a process of comparison, elimination, and adjustment, there were created six groups or classes of active shipping mines, with differentials to cover the varying adverse conditions of each class. The reserves, part of active mines, or independent tonnages, were placed in three groups or classes, according to their availability as future active mines.

The prospects were assessed as near as their value could be approximated according to their surrounding conditions and speculative value, on account of proximity to or possibly being part of known ore bodies, until development should make a reclassification necessary.

The mineral lands within the known ore belt were similarly treated, their values being gradually increased as they approached to what seemed good prospects.

Within 90 days after receipt of the tax commission's circular letter, mining companies and mineral owners generally complied with the request, furnishing data as to mining cost, analyses, prices, etc., and complete inventories of 258 mines and reserves, containing a total of 1,192,509,757 tons of merchantable iron ore.

The next step was the classification of this great tonnage into the 6 groups of active mines and the 3 groups of reserves.

Then was considered the average price of iron ore for a term of years at lower Lake ports and the costs of production and delivery, the difference being the full value in Minnesota of ore ready for shipment. Then followed considerations of the term of the lease, the average life of the mine and the present or discounted value of all the ore in the mine or reserve on a 4 per cent annuity basis. Then came an investigation through every known source—sales of realty, United States census, State auditor and State board of equalization reports, etc.—of the average per cent prevailing throughout the State of true to assessed value on all realty, and the application of that ratio to this mineral realty.

Proceeding in the above-outlined manner, the tax commission defined its classification and based the taxable value per ton of ore in the ground as follows:

CLASSIFICATION FOR 1907.

Active mines.

	Cents.
Class 1. Inexpensive mining and high-grade ore	33
Class 2. Comparatively inexpensive mining and lower-grade ore	30
Class 3. Higher mining cost and mixed-grade ore	27
Class 4. Underground, low mining cost and high-grade ore	23
Class 5. Underground, higher mining cost and medium-grade ore	19
Class 6. Underground, high mining cost, excess rock and water	14

Reserves.

Class 1. Partially developed and stripped, about ready for shipping	15
Class 2. Not stripped and not fully developed	10
Class 3. Not stripped and only partially developed	8

Prospects, unexplored but located near to developed tonnages, to be assessed at from $2,000 to $20,000 per 40-acre tracts.

Mineral lands unexplored but in ore belt, to be assessed at from $3 to $50 per acre.

After due notice and a public hearing, the tax commission placed a total assessed valuation of $186,720,026 on a total of 1,192,509,757 tons. In addition, the assessed valuation on 1858 prospects and parcels of mineral lands was raised to $4,986,656. The personality of the mining companies was assessed and the total was $4,334,490.

The 1908 grand total assessment made by the tax commission, after due notice and a public hearing, was $174,273,632 on a total of 1,193,728,959 tons, a decrease from 1907 value of $12,446,394. This decrease was caused by deductions for shipments, stock piles (assessed as personal property), corrections of tonnage estimates hastily prepared for the commission in 1907, and by revision of classifications.

In 1909 there was a further reclassification and the establishment of rates for active mines, their reserves and subreserves, to use in determining the assessed valuation per ton of iron ore in the ground, as follows:

Classification for 1909.

Class.	Active mines.	Reserves.	Subreserves.
	Cents.	*Cents.*	*Cents.*
1	33	21	15
2	30	18	15
3	27	15	10
4	23	11	..
5	19	10	..
6	14	..	..
..	..	8	..

And the total assessment made by the tax commission, after due notice and a public hearing, was $199,008,838 on 1,310,190,194 tons.

In 1910 the tax commission made the customary yearly adjustments; of deductions for shipments and stock piles, of additions for new tonnages and reclassifications of certain reserves into rates for active mines, and the commission then ordered a general raise of 5 per cent on all realty in the townships, villages, and cities (except the village of Gilbert, which had no ore) contained within the known ore belts of the Vermilion and Mesabi ranges. This action of the tax commission resulted in a total assessed value of $220,423,038 for 1910 upon a total of 1,347,596,291 tons.

This general raise established new rates for determining the assessed valuation per ton of iron ore in the ground, for the active mines, reserves, and subreserves. The 33-cent class changed to .3465 cents, the 30-cent class to .3150 cents, etc. The new rates are as follows:

Classification for 1910.

Class.	Active mines.	Reserves.	Subreserves.
	Cents.	*Cents.*	*Cents.*
1	0.3465	0.2205	0.1575
2	.3150	.1890	.1575
3	.2835	.1575	.1050
4	.2415	.1155	.....
5	.1995	.1050	.....
6	.1470	.....	.....
..	.....	.0840	.....

Reclassification and adjustments are necessarily made every year. From the remaining tonnage of the previous year must be deducted overestimates (subject to verification by the mining engineer to the tax commission), shipments and stock piles. New developed tonnage and increases in estimates must be added and rates must be increased as properties pass from reserves to active mines.

Since 1908 there has been a yearly increase in tonnage notwithstanding decreases by revised estimates and shipments, and there has been a largely increased yearly assessed value.

The summary of the work of the tax commission in assessing the mineral properties of the State in 1907–10, the State board assessment of 1906, and the shipments of those years are as follows:

	Remaining tonnage May 1.	Assessed value.	Minnesota shipments.
1906	.....	$64,486,409	25,611,384
1907 [1]	1,192,509,757	186,720,026	29,180,975
1908 [1]	1,193,728,959	174,273,632	18,098,894
1909 [1]	1,310,190,194	199,008,838	29,284,496
1910 [1]	1,347,596,291	220,423,038	30,317,583
1911	1,368,236,579	232,465,603	23,222,296

[1] Assessed value of the remaining tonnage only; the assessment of personalty, prospects, and mineral lands is not included.

The following is a comparative statement of reality assessments on tonnages, prospects, and mineral lands in towns, villages, and cities in the ore belts of St. Louis and Itasca Counties:

State board of equalization, 1906	$64,486,409
Minnesota tax commission, 1907	191,706,682
Minnesota tax commission, 1908	180,210,693
Minnesota tax commission, 1909	204,526,139
Minnesota tax commission, 1910	224,669,845

This great work has been accomplished by the tax commission without the slightest friction, without drastic measures of any kind, and apparently with the feeling among the operators that they were being fairly treated, and that they had every opportunity of presenting proof and of being heard at all times on points or questions at issue.

The estimates of the official mining engineers to the tax commission, the School of Mines of the University of Minnesota, and of its representative, Edward P. McCarty, E. M., professor of mining, in verifying tonnage estimates, are accepted cheerfully and practically without question. They inspire confidence and insure satisfaction to the operators and tax commission.

In fact, some operators know through this source for the first time the actual facts regarding their property.

The Cuyuna Range is still in its infancy. Exploration work on a large scale has just begun. There may be hundreds of millions of tons of iron ore awaiting development—only the expenditure of millions of dollars can determine this. See special Cuyuna Range report in this manual.

The Vermilion Range also may have a new life awaiting it from the tonnages yet undiscovered.

The Minnesota tax commission has brought to light vast tonnages and values. It has assessed every tonnage property on its own merits regardless of ownership and by a method that is fair to all concerned.

PRESENT VALUE OF IRON ORE ROYALTIES OF MINERAL LEASES CONTAINING MERCHANTABLE TONNAGE.

(By RUKARD HURD.)

NEWLY CREATED WEALTH THROUGH MINERAL VALUE.

The recent development of vast tonnages of iron ore in what has been considered a wilderness of rock and swamp, without timber and useless for agriculture and known as "mineral lands" or "wild lands," having previously only a nominal speculative or prospective value, has brought to life practically a new form of value—that of the present worth to the fee owner of the royalty on the ore therein covered by a mineral lease.

More and more must this element of value be reckoned with; by the State in the enforcement of the inheritance taxes, by probate courts in the administration of estates, and by other courts in adjudication and in proceedings of receiverships, trusts, bankruptcy, etc., where mineral rights are involved. Newly developed wealth usually entails litigation as to ownership and value.

EXTENT OF CAPITAL AND DIVERSITY OF OWNERSHIP.

To respond to furnace demands for tonnages of every possible grade, physical characteristics, and structure, and to obtain even a reasonable profit, mining operations must be conducted on a very extensive scale. Operation, equipment, supplies, wages, carrying charges, etc., require an enormous working capital. Therefore very few active mines or reserves containing developed tonnages of iron ore are owned in fee by the operating company. This would require an investment of capital as vast in proportion as is the developed tonnage, and in amount almost beyond comprehension. The Vermilion and Mesabi Ranges alone have a total of nearly 1,400,000,000 tons of merchantable iron ore assessed at $225,000,000, the full value of which approximates $562,000,000. These mines and reserves have a very large, widely scattered ownership, resident and nonresident. The known tonnage on the Mesabi Range is contained within some 35,000 acres. There is an equal or perhaps larger acreage within the so-called Mesabi "ore belt" either unexplored or explored and found barren of iron ore, or located as to almost certainly contain no ore.

MINERAL LEASES.

From the diversified fee ownerships the mine operators have from time to time secured, ordinarily upon a small payment, what is known as a "mining option" or the right to explore and to obtain a lease with the privilege of mining the ore. These leases are made for a period usually of 50 years, and the amount of royalty to be paid the fee owner for each ton of ore mined and shipped is stated therein. The lease also provides for an annual minimum payment in quarterly installments, being advance payments on account, and a charge against the maximum royalty on the ore as mined. Such minimum payment is made quarterly to the fee owner whether ore is mined or not. It is practically a guaranteed annual income, rental or annuity.

As a rule these leases are executed when the explorations and drillings seem to demonstrate that a sufficient tonnage will be developed to justify an agreed minimum payment based upon an estimate of expected minimum shipments. Complete explorations follow in due time and the full extent, quantity and quality of the ore body is determined. The fee owner receives regular reports of the explorations and mining. Occasionally leases may contain modifications, such as a sliding scale of royalty or an increased royalty for increase in metallic content.

All leases may be surrendered by the lessee upon giving stipulated notice, usually 90 days, in which event he loses all advance made on account of annual

minimum payments. Under all mineral leases the operating company pays all taxes and assessments.

VALUATION OF DEVELOPED LEASES.

The minimum annual payment is a purely estimated, arbitrary amount, and regular royalties range from 10 cents to $1.10, and even more, per ton. There is no uniformity in rates. Each lease must be valued according to its terms and own merits.

On mines or reserves that have been thoroughly explored, and where the tonnage is developed and the amount and grade of merchantable ore is known, a simple but accurate method of determining the present or discounted value of the total royalty of a mineral lease is herewith presented.

THE DETERMINING VALUATION FACTORS.

1. Unexpired period of the lease.
2. Amount of merchantable tonnage subject to royalty.
3. Total value of the same calculated by the royalty rate per ton.
4. Amount of the annual minimum payment or annuity, on estimated tonnage.
5. Amount of annual minimum payment or annuity on actual tonnage.
6. "Life of mine," the term required to mine out the total tonnage.
7. Present value of $1 per annum, payable quarterly.

RULE FOR DETERMINATION OF PRESENT VALUE OF ROYALTIES.

Total royalty.—Multiply the tonnage (reduced by the equivalent due by reason of any overpayment of annual minimum advanced) by the amount of royalty per ton. The result is the total royalty which the fee owner will ultimately receive, and it will be paid in, approximately quarterly installments.

Life of the mine.—Divide the total royalty, as ascertained, by the amount of the annual minimum payment. The result is the "life of the mine"; that is, the annuity-paying period, or the number of years required to exhaust the ore. Provided, however, that if this period as calculated extends beyond the lease, then the unexpired term of the lease should be arbitrarily considered as the "life of the mine." It is safe to assume that the operator will exhaust the ore during the life of the lease.

Present value of the royalty.—(A) Where total royalty does not exceed total of guaranteed annual minimum payments: Multiply the annual minimum payment, payable quarterly, by the present value of one dollar per annum, payable quarterly, at the assumed rate of interest, and for the number of years determined as the life of the mine. The result is the present royalty value of the lease.

(B). Where total royalty exceeds total of guaranteed annual minimum payments: Divide the total royalty by the unexpired term of the lease. The amount is the adjusted approximate annual minimum which will be paid. Multiply this annual minimum payment by the present value of $1 per annum, payable quarterly, at the assumed rate of interest and for the number of years of the unexpired term of the lease. The result is the present royalty value of the lease.

This method is a practical approximation for finding the true present value of the excess of developed tonnage over the assumed minimum. It will be specially noted that no general rule can be laid down when determining factors have yearly variations.

Attention is again called to the assumption that the ore will be exhausted before the expiration of the lease.

Illustration for A.—Term of lease, 50 years; unexpired term of lease, 30 years; royalty per ton, 25 cents; complete explorations develop as remaining, 2,000,000 tons; total royalty at 25 cents per ton, equals $500,000; life of the mine, $500,000 divided by $20,000, equals 25 years; guaranteed annual minimum payments, $20,000 multiplied by 25, equals $500,000.

$20,000 per year, payable quarterly, for 25 years.

Present value:	
At 7 per cent	$289.104
At 8 per cent	219.796
At 9 per cent	202.962
At 10 per cent	188.210

Illustration for B.—Term of lease, 50 years; unexpired term of lease, 30 years; royalty per ton, 25 cents; complete explorations develop as remaining, 4,000,000 tons; total royalty, at 25 cents per ton, equals $1,000,000; life of the mine, the unexpired term of the lease, equals 30 years; guaranteed annual minimum payments, $20,000 multiplied by 30, equals $600,000; excess of total royalty over annual minimum value, $1,000,000, minus $600,000, equals $400,000; adjusted approximate annual minimum payment, $1,000,000, divided by 30, equals $33,333.

$33,333 per year, payable quarterly, for 30 years.

Present value:	
At 7 per cent	$424.332
At 8 per cent	386.329
At 9 per cent	353.803
At 10 per cent	325.773

DETERMINING INTEREST RATE AND FACTORS.

While under the conditions named the security of the investment is unquestioned, for calculating present value the determining interest rate depends upon a number of factors, such as:

1. Average worth of money at the given time and interest rate expected for a long-time investment.
2. Fluctuating yearly income as the property passes back and forth from shipping and nonshipping stages, from large royalty income on shipments one year to minimum annual payments when not operating.
3. Quality of the ore and availability for furnace demands.
4. Amount of the tonnage and the time required under normal mining conditions to exhaust the ore.
5. Character and standing of the lessee, and his ability to meet the terms of the lease.
6. Possibility of a surrender of the lease, depending upon whether the ore is good or lean, monetary situation, and the financial condition of the lessee.

Under all these conditions such an investment demands and is entitled to a high rate of interest, even greater than a highest-grade preferred stock or bond security would yield. Capitalists would not entertain the purchase of such a proposition at ordinary rates of 5, 6, or even 7 per cent. While 10 per cent seems to be the customary prevailing interest rate, it would appear that 8 per cent to 10 per cent should be now used in calculating the present value of iron-ore royalties; that is, the investment required to purchase the royalty rights of a mineral lease containing known, developed tonnage of merchantable iron ore.

Royalty only basis of value.—It will be observed that the assessed or full value or market price of the tonnage is not and should not be considered. That concerns only the operating company and the tax officials. That value has gone beyond the control of the fee owner with the lease; his value is in the royalty alone.

Valuation of undeveloped leases.—On leases of properties not developed, or only partially developed, or containing present nonmerchantable ore, or where in underground mines an estimate of total tonnage is impossible, any appraisement of royalty value becomes a matter of judgment of experts familiar with mining and geological conditions.

Accuracy of information.—As has been previously stated in this manual, the exploration is now so thorough that the outlining of the ore bodies and the securing of accurate information to obtain correct estimates of the amount of tonnage and its grade, especially on the Mesabi Range, is now practically a known quantity. To a certain extent this holds true of many underground mines on other ranges. Where formerly their ore bodies could be followed, blocked out, and their tonnages known for only a year or two ahead, modern drilling methods now disclose the geological formation and determine the character and extent of the ore body.

Tables of present values.—For convenient reference in connection with this subject standard tables of present values, quarterly and annual, are embodied with and follow this article.

Yearly tonnage shipments of iron ore from each range of the Lake Superior district.

[Since the opening of the lock and canal at Sault Ste. Marie in 1855. Reprinted from the Iron Trade Review.]

Year.	Marquette.	Menominee.	Gogebic.	Vermilion.	Mesaba.	Grand total.
1855	1,449					1,449
1856	36,343					36,343
1857	25,646					25,646
1858	15,876					15,876
1859	68,832					68,832
1860	114,401					114,401
1861	49,909					49,909
1862	124,169					124,169
1863	208,055					208,055
1864	243,127					243,127
1865	236,208					236,208
1866	278,796					278,796
1867	473,567					473,567
1868	491,449					491,449
1869	617,444					617,444
1870	830,940					830,940
1871	779,607					779,607
1872	900,901					900,901
1873	1,162,458					1,162,458
1874	919,557					919,557
1875	891,257					891,257
1876	992,764					992,764
1877	1,010,494	4,593				1,015,087
1878	1,033,082	78,028				1,111,110
1879	1,130,019	245,672				1,375,691
1880	1,384,010	524,735				1,908,745
1881	1,579,834	727,171				2,307,005
1882	1,829,394	1,136,018				2,965,412
1883	1,305,425	1,047,415				2,352,840
1884	1,548,034	895,634	1,022	62,124		2,506,814
1885	1,480,422	690,435	119,860	225,484		2,516,201
1886	1,627,383	880,006	747,589	304,396		3,559,374
1887	1,851,414	1,193,343	1,303,267	394,252		4,742,276
1888	1,918,750	1,191,101	1,424,699	511,953		5,046,503
1889	2,634,816	1,796,755	2,016,391	844,082		7,292,644
1890	2,993,664	2,282,237	2,847,786	880,114		9,003,801
1891	2,512,242	1,824,619	1,839,574	894,618		7,071,053
1892	2,655,169	2,261,499	2,971,991	1,167,650	4,245	9,070,554
1893	1,835,893	1,466,197	1,329,185	820,021	613,620	6,065,716
1894	2,060,260	1,137,949	1,809,468	948,513	1,793,052	7,749,242
1895	2,097,838	1,923,798	2,547,976	1,077,838	2,781,587	10,429,037
1896	2,604,221	1,560,467	1,799,971	1,088,090	2,882,079	9,934,828
1897	2,715,035	1,937,013	2,258,236	1,278,481	4,275,809	12,464,574
1898	3,125,039	2,522,265	2,498,461	1,265,142	4,613,766	14,024,673
1899	3,757,010	3,301,052	2,795,856	1,771,502	6,626,384	18,251,804
1900	3,457,522	3,261,221	2,875,295	1,655,320	7,809,535	19,059,393
1901	3,245,346	3,619,053	2,938,155	1,786,063	9,004,890	20,593,507
1902	3,868,025	4,612,509	3,654,929	2,084,263	13,342,840	27,562,566
1903	3,040,245	3,749,567	2,912,708	1,676,099	12,892,542	24,271,761
1904	2,843,703	3,074,848	2,398,287	1,282,513	12,156,008	21,755,359
1905	4,215,572	4,495,451	3,705,307	1,677,186	20,158,099	34,252,115
1906	4,057,187	5,109,088	3,643,514	1,792,355	23,819,029	38,421,173
1907	4,388,073	4,964,728	3,637,102	1,685,267	27,495,708	42,170,878
1908	2,414,632	2,679,156	2,699,356	841,544	17,257,350	25,892,538
1909	4,256,172	4,875,385	4,088,057	1,108,215	28,176,281	42,504,110
1910	4,392,726	4,237,738	4,315,314	1,203,177	29,201,760	43,350,715
1911						32,130,411
Total	96,336,406	75,306,746	65,179,956	30,328,562	224,905,184	492,056,854
To adjust	−39,689	+144,047	−44,139			+60,219
Barraboo						972,309
Total	96,296,717	75,450,793	65,135,817	30,328,562	224,905,184	493,089,382

AUTHOR'S NOTE.—There should be added to the above grand total 1,032,528 tons, of which 972,309 tons are shipments from the Baraboo district in Wisconsin and 60,219 tons are to correct miscellaneous shipment records prior to 1891 from the Marquette, Menominee, and Gogebic Ranges. The correct grand total of shipments is 493,089,382 tons, as shown in preceding lists of individual mine shipments.

Prices of iron ore at lower ports for each range since opening.

[Reprinted from the Iron Trade Review.]

Year.	Old Range-Vermilion.		Mesabi.	
	Bessemer.	Non-Bessemer.	Bessemer.	Non-Bessemer.
1855	$10.00	$10.00	.....	.....
1856	8.00	8.00	.....	.....
1757	8.00	8.00	.....	.....
1858	6.50	6.50	.....	.....
1859	6.00	6.00	.....	.....
1860	5.25	5.50	.....	.....
1861	5.25	5.00	.....	.....
1862	5.25	5.37	.....	.....
1863	7.50	7.50	.....	.....
1864	8.50	8.50	.....	.....
1865	7.50	7.50	.....	.....
1866	9.50	9.50	.....	.....
1867	10.50	8.00	.....	.....
1868	8.25	8.25	.....	.....
1869	8.25	9.50	.....	.....
1870	8.50	8.50	.....	.....
1871	8.00	8.00	.....	.....
1872	9.00	7.50	.....	.....
1873	11.00	9.00	.....	.....
1874	9.00	7.00	.....	.....
1875	7.00	4.50	.....	.....
1876	6.75	5.50	.....	.....
1877	6.50	4.25	.....	.....
1878	5.50	4.25	.....	.....
1879	6.25	4.75	.....	.....
1880	9.25	8.00	.....	.....
1881	9.00	7.00	.....	.....
1882	9.00	6.25	.....	.....
1883	6.00	4.75	.....	.....
1884[1]	[1] 5.25	4.50	.....	.....
1885	4.75	4.00	.....	.....
1886	5.25	4.50	.....	.....
1887	6.00	5.00	.....	.....
1888	4.75	4.00	.....	.....
1889	4.50	4.50	.....	.....
1890	5.50	5.25	.....	.....
1891	4.50	4.25	.....	.....
1892	4.50	3.65	.....	.....
1893	3.85	3.20	$3.00	.....
1894	2.75	2.50	2.35	.....
1895	2.90	2.25	2.15	$1.90
1896	4.00	2.70	3.50	2.25
1897	2.60	2.15	2.25	1.90
1898	2.75	1.85	2.25	1.75
1899	3.00	2.15	2.40	2.00
1900	5.50	4.25	4.50	4.00
1901	4.25	3.00	3.25	2.75
1902	4.25	3.25	3.25	2.75
1903	4.50	3.60	4.00	3.20
1904	3.25	2.75	3.00	2.50
1905	3.75	3.20	3.50	3.00
1906	4.25	3.70	4.00	3.50
1907	5.00	4.20	4.75	4.00
1908	4.50	3.70	4.25	3.50
1909	4.50	3.70	4.25	3.50
1910	5.00	4.20	4.75	4.00
1911	4.50	3.70	4.25	3.50

[1] The Vermilion and Gogebic ranges opened in 1884.

Prices of pig iron and production.

[Reprinted from the Iron Trade Review.]

Year.	Price.	Long tons.	Year.	Price.	Long tons.
1855	$27.75	700,159	1883	$19.04	4,595,510
1856	27.12	788,515	1884	17.18	4,097,868
1857	26.37	712,640	1885	15.27	4,044,526
1858	22.25	629,548	1886	18.96	5,683,329
1859	23.37	750,560	1887	21.37	6,417,148
1860	22.75	821,223	1888	17.38	6,489,738
1861	20.25	653,164	1889	18.00	7,603,642
1862	23.87	703,270	1890	22.15	9,202,703
1863	35.25	846,075	1891	15.15	8,279,870
1864	59.25	1,014,282	1892	15.00	9,157,000
1865	46.12	831,770	1893	12.65	7,124,502
1866	46.87	1,205,663	1894	9.65	6,657,388
1867	44.12	1,305,023	1895	9.40	9,446,308
1868	39.25	1,431,250	1896	12.40	8,623,127
1869	40.62	1,711,287	1897	8.35	9,652,680
1870	33.25	1,665,179	1898	9.55	11,773,934
1871	35.12	1,706,793	1899	10.30	13,620,703
1872	48.87	2,548,713	1900	24.15	13,789,242
1873	42.75	2,560,963	1901	16.15	15,878,354
1874	30.25	2,401,262	1902	15.90	17,821,307
1875	25.50	2,023,733	1903	21.50	18,009,252
1876	22.25	1,868,961	1904	13.35	16,497,033
1877	18.87	2,066,594	1905	15.50	22,992,380
1878	17.62	2,301,215	1906	17.25	25,307,191
1879	21.50	2,741,853	1907	21.50	25,781,361
1880	28.50	3,835,191	1908	16.00	15,936,018
1881	25.12	4,144,254	1909	14.75	25,795,471
1882[1]	21.85	4,623,323	1910	19.00	27,298,545

[1] Prior to 1882 prices are for No. 1 anthracite foundry pig iron at Philadelphia. Succeeding prices are for Bessemer pig iron in the valley at the time ore prices were fixed.

Production of iron ore in the United States in 1907 and 1908.

[Reprinted from "The Production of Iron Ores, Pig Iron, and Steel in 1908," United States Geological Survey, 1909.—By E. C. Harder.]

States.	Gross tons.		States.	Gross tons.	
	1907	1908		1907	1908
Minnesota	28,969,658	18,652,220	Wisconsin	838,744	733,993
Michigan	11,830,342	8,839,199	Pennsylvania	837,287	443,161
Alabama	4,039,453	3,734,438	Tennessee	813,690	635,343
New York	1,375,020	697,473	New Jersey	549,760	394,767
Montana, Nevada, New Mexico, Utah, Wyoming, Texas, Arkansas, Colorado, California, and Washington	949,925	584,591	Georgia	444,114	321,060
			Missouri and Iowa	111,768	98,414
			North Carolina	50,439	48,522
			Connecticut and Massachusetts	37,166	28,112
Virginia	786,856	692,223	Ohio	23,589	26,585
West Virginia, Kentucky, and Maryland	62,808	53,235	Total	51,720,619	35,983,336

Imports of iron ore, by countries, in 1907, 1908, and 1909.

Countries.	1907		1908		1909	
	Gross tons.	Values.	Gross tons.	Values.	Gross tons.	Values.
Cuba	657,133	$2,522,710	579,668	$1,756,091	927,774	$2,681,028
Spain	296,318	760,801	126,074	331,070	291,547	664,460
Greece	23,800	42,927	4,580	5,311	19,080	21,782
Newfoundland	89,685	97,735	48,285	48,285	224,395	330,056
United Kingdom	5,765	16,491	2,028	32,027	869	12,846
Germany	273	2,096	602	4,052	3	100
Canada	26,878	51,328	5,013	16,321	27,155	84,613
Belgium	125	1,102	1	28	3	179
Russia in Europe	54,995	161,697	5,750	15,220	32,010	62,418
French Africa	65,940	252,897	.....	.....	37,208	67,515
Other countries	8,256	27,699	4,627	15,843	134,913	654,081
Total	1,229,168	3,937,483	776,898	2,224,248	1,694,957	4,579,078

Imports of iron ore for 20 years—totals for 1881–1901.

Year.	Gross tons.	Year.	Gross tons.	Year.	Gross tons.
1881	782,887	1891	912,856	1901	966,950
1882	589,655	1892	806,585	1902	1,165,470
1883	490,875	1893	526,951	1903	980,440
1884	487,820	1894	168,541	1904	487,613
1885	390,786	1895	524,153	1905	845,651
1886	1,039,433	1896	682,806	1906	1,060,390
1887	1,194,301	1897	489,970	1907	1,229,168
1888	587,470	1898	187,093	1908	776,898
1889	853,573	1899	674,082	1909	1,694,957
1890	1,246,830	1900	897,831	1910	2,591,031

NOTE.—For many years Cuba has annually shipped more than one-half of the imported iron ore.
The above tables are credited to the Bureau of Statistics of the United States Department of Commerce and Labor.

Apparent annual iron ore consumption in the United States, 1889–1910, gross tons.

[Compiled from the American Iron and Steel Association Statistics and 1910 report and "The Production of Iron Ores, Pig Iron, and Steel in 1908," United States Geological Survey, 1909.—By E. C. Harder.]

Year.	Domestic iron ore produced.	Stocks of ore at mines.	Imports.	Exports.	Stocks of ore at Lower Lake ports Dec. 1.	Zinc residium.	Apparent consumption.	Pig iron produced.
1889	14,518,041	2,256,973	853,573	.....	2,607,106	43,648	14,366,562	7,603,642
1890	16,036,043	2,000,000	1,246,830	.....	3,893,487	48,560	16,302,025	9,202,703
1891	14,591,178	2,450,279	912,864	.....	3,508,489	38,228	15,476,989	8,279,870
1892	16,296,666	2,911,740	806,585	.....	4,149,451	31,859	16,032,687	9,157,000
1893	11,587,029	3,526,161	526,951	.....	4,070,710	37,512	11,616,412	7,124,502
1894	11,879,079	3,236,198	167,307	.....	4,834,247	26,981	11,600,393	6,657,388
1895	15,957,614	2,976,494	524,153	.....	4,415,712	43,249	17,203,255	9,446,308
1896	16,005,449	3,405,302	682,806	.....	4,954,984	44,953	15,765,128	8,623,127
1897	17,518,046	3,098,287	489,970	.....	5,923,755	33,924	17,380,184	9,652,680
1898	19,433,716	2,846,457	187,208	.....	5,136,407	48,502	20,708,604	11,773,934
1899	24,683,173	2,320,278	674,082	40,665	5,530,283	65,010	25,513,903	13,620,703
1900	27,553,161	3,709,950	897,831	51,460	5,904,670	87,110	26,722,583	13,789,242
1901	28,887,479	4,239,823	966,950	64,703	5,859,663	52,311	29,357,171	15,878,354
1902	35,554,135	3,834,717	1,165,470	88,445	7,074,254	65,246	35,886,921	17,821,307
1903	35,019,308	6,297,888	980,440	80,611	6,371,085	73,264	34,232,399	18,009,252
1904	27,644,330	4,666,931	487,613	213,865	5,763,399	68,189	30,224,910	16,497,033
1905	42,526,133	3,812,281	845,651	208,017	6,438,967	90,289	43,433,138	22,992,380
1906	47,749,728	3,281,789	1,060,390	265,240	6,252,455	93,461	49,355,343	25,307,191
1907	51,720,619	3,033,110	1,229,168	278,208	7,385,728	93,413	51,880,398	25,781,361
1908	35,063,336	6,055,397	776,898	309,099	8,441,533	110,225	32,473,268	15,936,018
1909	51,294,271	6,135,271	1,694,957	455,934	8,065,789	141,264	52,080,428	25,795,471
1910	56,889,734	9,406,235	2,591,031	644,875	9,426,681	137,173	56,161,091	27,298,545

The above table includes data on certain factors from which an approximate estimate of the annual consumption of iron ore in the United States is deduced. The result is of course merely an approximation, for no data are available on certain factors which should enter into the final result. The elements accounted for in the table and estimate are (1) domestic iron-ore production; (2) stock of ore at mines; (3) imports of ore; (4) exports of ore; (5) stocks of ore at Lake ports; (6) zinc residuum production.

Production of steel in the United States, 1860–1910, gross tons.

[Compiled from the American Iron and Steel Association Statistics and 1910 report and "The Production of Iron Ores, Pig Iron, and Steel in 1908," United States Geological Survey, 1909.—By E. C. Harder.]

Year.	Bessemer.	Open hearth.	Crucible.	Other steel.	Total.
1860	.....	.....	[1] 11,838	.....	11,838
1863	.....	.....	8,075	.....	8,075
1864	.....	.....	9,258	.....	9,258
1865	.....	.....	13,627	.....	13,627
1866	.....	.....	16,940	.....	16,940
1867	2,679	.....	16,964	.....	19,643
1868	7,589	.....	19,197	.....	26,786
1869	10,714	893	19,643	.....	31,250
1870	37,500	1,339	29,911	.....	68,750
1871	40,179	1,785	31,250	.....	73,214
1872	107,239	2,679	26,125	6,911	142,954
1873	152,368	3,125	31,059	12,244	198,796
1874	171,369	6,250	32,436	5,672	215,727
1875	335,283	8,080	35,180	11,256	389,799
1876	469,639	19,187	35,163	9,202	533,191
1877	500,524	22,349	36,098	10,647	569,618
1878	653,773	32,255	38,309	7,640	731,977
1879	829,439	50,259	50,696	4,879	935,273
1880	1,074,262	100,851	64,664	7,558	1,247,335
1881	1,374,247	131,202	80,145	2,720	1,588,314
1882	1,514,687	143,341	75,973	2,691	1,736,692
1883	1,477,345	119,356	71,835	4,999	1,673,535
1884	1,375,531	117,515	53,270	4,563	1,550,879
1885	1,519,430	133,376	57,599	1,515	1,711,920
1886	2,269,190	218,973	71,973	2,367	2,562,503
1887	2,936,033	322,069	75,375	5,594	3,339,071
1888	2,511,161	314,318	70,279	3,682	2,899,440
1889	2,930,204	374,543	75,865	5,120	3,385,732
1890	3,688,871	513,232	71,175	3,793	4,277,071
1891	3,247,417	579,753	72,586	4,484	3,904,240
1892	4,168,435	669,889	84,709	4,548	4,927,581
1893	3,215,686	737,890	63,613	2,806	4,019,995
1894	3,571,313	784,936	51,762	4,081	4,412,032
1895	4,909,128	1,137,182	67,666	858	6,114,834
1896	3,919,906	1,298,700	60,689	2,394	5,281,689
1897	5,475,315	1,608,671	69,959	3,012	7,156,957
1898	6,609,017	2,230,292	89,747	3,801	8,932,857
1899	7,586,354	2,947,316	101,213	4,974	10,639,857
1900	6,684,770	3,398,135	100,562	4,862	10,188,329
1901	8,713,302	4,656,309	98,513	5,471	13,473,595
1902	9,138,363	5,687,729	112,772	8,386	14,947,250
1903	8,592,829	5,829,911	102,434	9,804	14,534,978
1904	7,859,140	5,908,166	83,391	9,190	13,859,887
1905	10,941,375	8,971,376	102,233	8,963	20,023,947
1906	12,275,830	10,980,413	127,513	14,380	23,398,136
1907	11,667,549	11,549,736	131,234	14,075	23,362,594
1908	6,116,755	7,836,729	63,631	6,132	14,023,247
1909	9,330,783	14,493,936	107,355	22,947	23,955,021
1910	9,412,722	16,504,509	122,303	55,365	26,094,919

[1] Part of the 1860–1871 crucible steel production should be credited to "Other steel."

The first steel produced in this country was probably made in Connecticut in 1728 by Samuel Higley and Joseph Dewey. Crucible steel was first successfully produced in the United States in 1832 at the works of William and John H. Garrard, at Cincinnati, Ohio. Bessemer steel was first made in this country in September, 1864, by William F. Durfee at an experimental plant at Wyandotte, Mich., and open-hearth steel in 1864 by the New Jersey Steel & Iron Co. at Trenton, N. J.

Mr. YOUNG. I also submit extracts from Report of the Minnesota Tax Commission, 1910: Production of Iron Ore and Steel in 1910, by Ernest F. Burchard; A Decade in United States Steel, Dow, Jones & Co.; Iron Ores of the United States, by C. W. Hayes, Bulletin 394, Geological Survey, and certain extracts from the Statistical Abstract, 1910.

The statement and papers submitted by Mr. Young follows:

VALUATION OF MINES AND MINERAL LANDS FOR TAXATION PURPOSES.

One of the most important problems that confronted the tax commission when it was first created in 1907 was the valuation of mines and mineral properties for purposes of taxation. Prior to that time no definite method of ascertaining the quantity, quality, or value of iron ore in any given description of land had been adopted by the State. The attempts of local assessors to value iron-ore properties on the hit or miss plan often resulted in grave inequalities and were generally unsatisfactory to both mine owners and the State. The commission early realized the necessity of devising some system of measuring values that would be fair to the State and the owners of mineral properties and at the same time be so scientifically correct in principle as to admit of little dispute.

The following extracts from the biennial report of the tax commission for 1908 outline the work of the commission in classifying mineral properties and in determining rates of valuation for assessment purposes:

"The problem of taxing the iron-ore properties having come before the tax commission, two questions required early consideration—one, how to ascertain the value of such properties; and the other, what basis of valuation would be accepted as a means of getting at the value. Upon the method of procedure two limitations were placed—one of the constitution and the law, in which the principles of the general property tax had been laid down; and the other, the nature and character of the industry itself.

"Many opinions existed among mining men, State officers, members of the legislature, and the public generally as to the value of ore in the ground. The values were stated to be for ore in the ground from 5 cents to $1 per ton. Even mining men themselves placed the values for taxing purposes at amounts varying from 2 cents to 30 cents per ton. There was, therefore, little in the form of definite information to be had regarding the basis of taxation of iron-ore properties.

"The method of making the assessment of properties on the ranges was the outcome of experience. The attempts of assessors to value iron-ore properties were accompanied by complaints of inequalities among mine owners that finally created a sort of de facto board of equalization, which determined the value of the different operating mines according to output. This system, while unsatisfactory from the point of view of equalization of values, was accepted by the mining men as more satisfactory than the valuation made under the assessing machinery of the local governments. Every two years the mining representatives met at Duluth and distributed the real property assessment over the operating mines according to their output. The small mines were the losers and the larger and more valuable mines the gainers by this method of valuation. Prior to 1897 the tax levied upon the mines of the State was at the rate of 1 cent per ton of output. This law was repealed and the tax determined by the assessed value of the mining property. The commission therefore had no criteron by which to determine the values. Prior to 1897 the tonnage tax, after that date the valuations, continually shifted with the growth of the properties, and the distribution to mines according to output prevented the establishment of any principle of local assessment.

* * * * * * *

"The problem before the tax commission was how to assess these properties, vast in extent and great in value. The first step was to secure information. Consultation with State officers, the collection of books, pamphlets, maps, and newspaper clippings upon the iron properties, the securing of State documents and the reports of committees, were the first steps toward getting information. After careful consideration of the situation and the problems involved, the commission sent, under date of June 18, a list of questions to the various companies engaged in the business of iron mining in the State of Minnesota. These questions were so framed as to cover every important phase of the mining industry, and the hope and expectation was to secure a large amount of information regarding the cost of operating, output, nature, and character of ores, method of mining, and nature of ownership.

* * * * * * *

"After a great deal of correspondence, the commission received late in August returns from practically every mining company engaged in operation and from individuals owning iron properties. This data was supplemented by information gathered by the commission during its visit to the range in the

first half of August. Through this visit the commission became familiar with types and locations of mines, character of ore, and general conditions existing in the mining business.

"Meantime the questions of classification, analysis, and value of these properties were being considered carefully by the commission. The differences existing between mines in their geological conditions, difficulty of mining, character of the ore, and the nature of mining rights made it impossible to consider all mineral properties as belonging to the same group. For the purpose of making some distinction between the different mines and prospects, five grades of operating mines were created and four grades of prospects. These grades were determined by facts secured through the data furnished by the mining companies and the observations of the commission. The first grade of operating mines included those that were operated at a low cost per ton and were putting out good grades of ore. A distinction was made between the mines in the first grade in that practically no mines approached the Mahoning and Hull-Rust in ease of operation and character of ore. Somewhat more expensively operated mines, though distinctly above the second grade, were placed in the 1-b class. There were mines like tthe Biwabik, Mountain Iron, Burt-Pool, and Morris. The remaining grades of operating mines were determined by the cost of operation, returns, and grades of ore. The prospect group was divided into four classes, depending upon the state of their advancement toward an operating mine; thus, the first class of prospects were properties on the verge of mining operations. Good examples of this class are to be found in the instances of the Gilbert, Canesteo, Frantz, Iroquois, and certain parts of the Hull-Rust and Mahoning properties. The second class prospects were those properties that had not been advanced so far on the road to operating mines, but upon which drilling and testing had demonstrated the presence of ore in paying quantities. The third class consisted of forties in the neighborhood of good tonnage properties. In the fourth class the ore land acreage was placed, since it had a more or less speculative value.

"The last of August the commission sent notice to the owners of iron-ore properties calling upon them to appear on September 5 at 10 a. m. in the rooms of the tax commission at the capitol in St. Paul and show cause why the valuations of the mining properties should not be materially increased. At the meeting, which was attended by representatives of practically all mine owners and operators, the commission presented its scheme of classification and a tentative list of valuations. Frank discussion and criticism followed, bringing out many valuable suggestions and much new information. The hearing was continued over to the following Monday, when the commission presented the final classification, rates, and valuation of the iron-ore properties.

"The factors taken under consideration in the valuation of mining properties are as follows: (1) Geological conditions, (2) difficulty of mining, (3) character of the ore, (4) character of mining rights.

"Mining properties are divided into two grand groups—operating mines and prospects.

"For the purpose of determining the valuation of operating mines, they are classed under five groups, as follows:

"Class 1. (*a*) Properties where mining is comparatively inexpensive and the ore high grade. (*b*) Properties where mining is comparatively inexpensive and the ore of lower grade.

"Class 2. Properties where mining is somewhat more difficult and mining cost greater than in the case of class 1, and the ore of mixed grade.

"Class 3. Underground properties where the expense of mining is comparatively low for that kind of mining and the ore of high grade.

"Class 4. Underground or milling-pit properties of distinctly second grade, determined by a higher cost of mining and lower grade of ore than in the case of class 3.

"Class 5. Mines of inferior character where expenses of operation are high.

"Prospects are classed under four groups, as follows:

"Class 1. Lands that have been drilled and test-pitted, and where stripping of the overburden has been carried on. In other words, where the property is about to become a mine.

"Class 2. Lands that have been drilled and test-pitted, and ore found in some abundance.

"Class 3. Unexplored lands near good mining properties.

"Class 4. Lands that have not been explored, but are in the well-known ore

"*Rates of valuation.*

[Per ton in the ground.]

	Class 1.	Class 2.	Class 3.	Class 4.	Class 5.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Operating mines {(a)	33	27	23	19	14
Operating mines {(b)	30				
Prospects	15	10	8	$3 to $50 per acre.	

"In the determination of the rates the commission was confronted by a number of serious problems—how to get a taxable valuation of iron properties that would be fair to the State and to the owners of the properties. The rates arrived at were in the main determined by several factors:

"First. The difference between the cost of mining and the average price of ore during the last three years.

"Second. By the present worth of the difference for a period of 20 years on a basis of 4 per cent rate of interest.

"Third. By the percentage of the assessed valuation of real property in the State to the full value of such property.

"The fact that the differences in mining cost vary greatly with the different properties, due to management, condition of the mine, presence of water, depth of ore, character of equipment, grades and location of ores, required the creating of more than one class of mining properties. The classes referred to in the memorandum above were created and the rates established for them were determined as far as possible by the differences between mines in cost of operation, difficulty of mining, and grade of ore. This method of valuation left much to be desired, but no better one was suggested at the hearing of mine owners, and it was the best that the commission could do under the ad valorem requirements of the law."

Summary of results.—Having decided upon classification and rates, the commission proceeded to list and classify the 2,116 different mines, mineral properties, and prospects. The reports submitted by the mining companies and owners of iron properties in St. Louis and Itasca Counties gave a total tonnage of 1,191,969,757 tons. The commission assessed the tonnage properties at $186,720,026 and acreage prospects and miscellaneous iron lands at $4,986,656, making a total assessment for 1907 of $191,706,682, distributed among the different classes of mines and prospects as follows:

Summary of tonnages and valuations by classes, 1907.

	Class.	Tonnage.	Rate.	Valuation.
Mines	1	43,185,685	33	$14,251,276
	1b	66,442,923	30	19,932,876
	2	25,176,067	27	6,797,538
	3	138,845,839	23	32,134,497
	4	91,494,762	19	17,653,975
	5	105,821,134	14	14,561,749
Prospects	1	271,863,523	15	40,779,516
	2	204,635,249	10	20,483,518
	3	244,504,575	8	19,490,345
Unclassed mines				634,736
Acreage prospects				998,000
Other iron lands				2,257,700
Total		1,191,969,757		189,975,726
Other lands in iron belt				1,730,956
Total assessment				191,706,682

The total assessment for 1907 was distributed as follows:

St. Louis County	$177,699,562
Itasca County	14,007,120
	191,706,682

Summary of 1908 assessment.—The 1908 assessment of mineral properties was based upon tonnage estimates hastily prepared by the mining companies to meet the immediate needs of the situation. In addition, the tax commission had a very limited time in which to classify the different mines and mineral properties. Some errors were made in both tonnage estimates and classification which were corrected in the 1908 assessment. While the reclassification resulted in a tonnage increase of 1,219,202 tons, there was a net decrease of $11,495,989 in the assessed value of mineral properties as compared with 1907, the total assessment for 1908 being $180,210,693. This amount was distributed among the different classes of mines and prospects as follows:

Summary of tonnages and valuations by classes, 1908.

	Class.	Tonnage.	Rate.	Valuation.
Mines	1	35,245,360	33	$11,630,969
	1b	59,450,318	30	17,835,095
	2	32,837,331	27	8,866,079
	3	99,173,967	23	22,810,011
	4	53,708,162	19	10,204,552
	5	90,519,746	14	12,672,766
Prospects	1	279,980,702	15	41,997,100
	2	243,760,744	10	24,376,067
	3	296,512,629	8	23,880,993
Acreage prospects				2,004,500
Total		1,193,188,959		176,278,132
Other lands in iron belt				3,932,561
Total assessment				180,210,693

The total assessment for 1908 was distributed as follows:

St. Louis County	$164,381,474
Itasca County	15,829,219
	180,210,693

The assessment of 1909.—In 1909 a rearrangement of classes was made, the various mineral properties being classified as active mines, reserves, and subreserves. The new classes and rates were as follows:

	Active mines.	Reserves.	Subreserves.
	Cents.	*Cents.*	*Cents.*
Class 1	33	21	15
Class 2	30	18	10
Class 3	27	15	.....
Class 4	23	11	.....
Class 5	19	10	.....
Class 6	14	8	.....

The only change made in the active mines in the new classification was in the class number, 1b being eliminated, and the classes numbered from 1 to 6 consecutively. Considerable change, however, was made in the reserve classes, five new classes being added and a substantial increase in rates made in two other classes. It was felt that certain reserves adjacent to active mines and shortly to become shipping mines should take a higher rate than the one first imposed by the commission. Subreserves are a secondary class of reserves somewhat more remote from certain classes of active mines than reserves.

A number of prospects now called reserves became active mines during 1908 and were reclassified in 1909, taking the higher rate imposed on shipping mines. New tonnages were added and a number of new properties were placed in the reserve or prospect class and assessed accordingly. Of the total tonnage increase of 117,001,235 tons over 1908, 12,522,887 tons were added as the result of the work of the school of mines in verifying estimates, the balance coming from corrected reports, additional explorations, and new discoveries. The total assessed values of tonnages, reserves, and other lands in the iron belt amounted to $204,526,139, being an increase of $24,315,446 over 1908.

A detailed statement showing tonnages and valuations by classes and by assessment districts follows:

Summary of values of iron-ore properties for 1909.

Assessment district.	Active mines.						Reserves and subreserves.						Prospects arbitrary valuation.	Total valuation.
	Class 1 (rate 33 cents).	Class 2 (rate 30 cents).	Class 3 (rate 27 cents).	Class 4 (rate 23 cents).	Class 5 (rate 19 cents).	Class 6 (rate 14 cents).	Class 1 (rate 21 cents).	Class 2 (rate 18 cents).	Class 3 (rate 15 cents).	Class 4 (rate 11 cents).	Class 5 (rate 10 cents).	Class 6 (rate 8 cents).		
St. Louis County:														
Aurora village				$437,049	$233,260	$275,476					$100,800		$500,000	$1,546,585
Biwabik town		$454,768		477,514	257,644	813,927			$30,000		190,000		25,750	2,249,603
Biwabik village		848,370				31,500					250,000			1,129,870
Breitung town				133,795										133,795
Buhl village						280,000			4,180,005		1,817,143	$877,286	165,000	7,319,434
Chisholm village				4,692,323	456,670	6,397,326				$620,253	1,668,024	922,341		14,756,937
Clinton town													5,000	5,000
Ely city				1,500,094									1,000	1,501,094
Evaleth city				1,120,606										1,120,606
Fayal town			$3,805,496		48,670				153,478		52,480			4,060,124
Great Scott town						903,212					469,583	758,093	38,490	2,169,378
Hibbing village		10,255,324		4,092,906	421,048	1,800,508	$24,436,574		1,200,000	3,187,981	4,793,911	250,070		50,438,322
McKinley village						28,432							2,000	30,432
Mesaba town					39,943	235,571					56,461	155,957	1,000	488,932
Mesaba village												104,907		104,907
Missabe Mountain town			4,920,438	9,712,198	683,821	711,112	693,000		5,869,757	15,839	537,940	17,316	51,000	23,212,421
Morse town				251,565										251,565
Mountain Iron village		6,660,068		1,056,187	954,012	192,918		$34,001	437,439		295,295			9,629,920
Nichols town									1,601,250		50,000	290,255		1,941,505
Sparta village									265,432					265,432
Stuntz town	$11,814,136		650,800	2,163,558	5,735,211	1,855,055	5,946,229		1,892,940	222,051	7,889,470	8,759,501	738,000	47,666,951
Unorganized, 58½–17				588,534										588,534
Virginia city					760				4,472,169		3,095,370	1,027,069		8,595,368
White town					452,158				2,646,160		1,110,106	2,131,486		6,339,910
Wourri town												73,936		73,936
Total	11,814,136	18,218,530	9,376,734	26,226,329	9,283,197	13,525,037	31,075,803	34,001	22,748,630	4,046,124	22,376,583	15,368,217	1,527,240	185,620,561
Itasca County:														
Arbo town												66,172	10,000	76,172
Bass Brook town												245,536	25,000	270,536
Calumet village												11,401		11,401
Coleraine village											1,058,056	1,969,062		3,027,118
Grand Rapids town												175,640	7,500	183,140

Assessment district.	Active mines.						Reserves and subreserves.						Prospects, arbitrary valuation.	Total valuation.
	Class 1 (rate 33 cents).	Class 2 (rate 30 cents).	Class 3 (rate 27 cents).	Class 4 (rate 23 cents).	Class 5 (rate 19 cents).	Class 6 (rate 14 cents).	Class 1 (rate 21 cents).	Class 2 (rate 18 cents).	Class 3 (rate 15 cents).	Class 4 (rate 11 cents).	Class 5 (rate 10 cents).	Class 6 (rate 8 cents).		
Itasca County—Continued.														
Nashwauk village						$1,300,070						$6,693		$1,306,763
Taconite village												1,350,011		1,350,011
Total					$753,440	1,300,070			$745,011		$1,088,056	11,028,940	$57,500	14,973,017
Grand total	$11,814,136	$18,218,530	$9,376,734	$26,226,329	10,036,637	14,825,107	$31,075,803	$34,001	23,493,641	$4,046,124	23,464,639	26,397,157	1,584,740	200,593,578

Summary of tonnages for 1909.

Assessment district.	Active mines.						Reserves and subreserves.						Total tonnage.
	Class 1 (rate 33 cents).	Class 2 (rate 30 cents).	Class 3 (rate 27 cents).	Class 4 (rate 23 cents).	Class 5 (rate 19 cents).	Class 6 (rate 14 cents).	Class 1 (rate 21 cents).	Class 2 (rate 18 cents).	Class 3 (rate 15 cents).	Class 4 (rate 11 cents).	Class 5 (rate 10 cents).	Class 6 (rate 8 cents).	
St. Louis County:													
Aurora village				$1,900,212	$1,227,686	$1,967,690					$1,008,000		6,103,588
Biwabik town		$1,515,895		2,076,147	1,356,019	5,813,768			$200,000		1,900,000		12,861,829
Biwabik village		2,827,901				225,000					2,500,000		5,552,901
Breitung town				581,719									581,719
Buhl village						2,000,000			27,866,703		18,171,432	$10,966,075	59,004,210
Chisholm village				20,401,406	2,403,527	45,695,184				$5,638,661	16,680,243	11,529,257	102,348,278
Clinton town													
Ely city				6,522,145									6,522,145
Eveleth city				4,872,202									4,872,202
Fayal town			$14,094,430		256,159				1,023,187		524,800		15,898,576
Great Scott town						6,451,511					4,695,829	9,476,168	20,623,508
Hibbing village		34,184,415		17,795,245	2,216,047	12,860,780	$116,364,642		8,000,000	28,981,648	47,939,110	3,125,876	271,467,763
McKinley village						203,088							203,088
Mesaba town					210,227	1,682,652					564,608	1,949,456	4,406,943
Mesaba village												1,311,329	1,311,329
Missabe Mountain town			18,223,841	42,226,950	3,599,058	5,079,380	3,300,000		39,131,717	143,993	5,379,410	216,460	117,300,809
Morse town				1,093,760									1,093,760

Mountain Iron village		22,200,229		4,592,119	5,021,112	1,377,991		188,898	2,916,264		2,952,592		39,249,565
Nichols town									10,675,000		500,000	3,628,187	14,803,187
Sparta village									1,769,545				1,769,545
Stuntz town	35,800,413		2,410,374	9,406,775	30,185,324	13,250,397	28,315,378		12,619,601	2,018,650	78,894,707	109,493,781	322,395,400
Unorganized 58½–17				2,558,844									2,558,844
Virginia city					4,000				29,814,461		30,953,707	12,838,355	73,610,523
White town					2,379,780				17,641,074		11,101,062	26,643,575	57,765,491
Wourri town												924,206	924,206
Total	35,800,413	60,728,440	34,728,645	114,027,524	48,858,939	96,607,441	147,980,020	188,898	151,657,552	36,782,952	223,765,860	192,102,725	1,143,229,409
Itasca County:													
Arbo town												827,156	827,156
Bass Brook town												3,069,207	3,069,207
Calumet village												142,510	142,510
Coleraine village											10,580,565	24,613,296	35,193,861
Grand Rapids town												2,195,502	2,195,502
Greenway town											300,000	4,063,427	4,363,427
Kewatin village					2,840,472							24,707,468	27,547,940
Marble village												55,623,000	55,623,000
Nashwauk town					1,125,000				4,966,742			5,661,411	11,753,153
Nashwauk village						9,286,221						83,660	9,369,881
Taconite village												16,875,148	16,875,148
Total					3,965,472	9,286,221			4,966,742		10,880,565	137,861,785	166,960,785
Grand total	35,800,413	60,728,440	34,728,645	114,027,524	52,824,411	105,893,662	147,980,020	188,898	156,624,294	36,782,952	234,646,425	329,964,510	1,310,190,194

Summary of tonnages and valuation by classes, 1909.

	Class.	Tonnage.	Rate.	Valuation.
Mines	1	35,800,413	33	$11,814,136
	2	60,728,440	30	18,218,530
	3	34,728,645	27	9,376,734
	4	114,027,524	23	26,226,329
	5	52,824,411	19	10,036,637
	6	105,893,662	14	14,825,107
Reserves and subreserves	1	147,980,020	21	31,075,803
	2	188,898	18	34,001
	3	156,624,294	15	23,493,641
	4	36,782,952	11	4,046,124
	5	234,648,425	10	23,464,639
	6	329,964,510	8	26,397,157
Acreage prospects				1,584,740
Total		1,310,190,194		200,593,578
Other lands in iron belt				3,932,561
Total assessment				204,526,139

The total assessment for 1909 was distributed as follows:

St. Louis County	$187,193,557
Itasca County	17,332,582
	204,526,139

The 1910 assessment.—Changes were made in the classification of a number of mineral properties in 1910. Several reserves had become shipping mines during 1909 and were reclassed and assessed as active mines in 1910. New tonnages, developed by explorations and through the work of the school of mines, were added to the assessment rolls. The total increase in tonnage amounted to 66,690,593 tons, from which 29,284,496 tons were deducted for shipments during the year, making a net tonnage increase over 1909 of 37,406,907 tons.

New rates, 1910.—After the work of reclassification had been completed and new tonnages and reserves had been added to the assessment rolls, the commission made a general raise of 5 per cent on all mines, reserves and other lands in the ore belt. Under this increase the rates used for determining the taxable value of iron ore in the ground in 1910 were as follows:

	Active mines.	Reserves.	Sub-reserves.
	Cents.	*Cents.*	*Cents.*
Class 1	34.65	22.05	15.75
Class 2	31.50	18.90	10.50
Class 3	28.35	15.75	.....
Class 4	24.15	11.55	.....
Class 5	19.95	10.50	.....
Class 6	14.70	8.40	.....

The total assessed values of mines, reserves, and other lands in the ore belt under the new rates adopted in 1910 amounted to $224,669,845, being a net increase of $20,143,706 over 1909, and a total increase of $44,459,152, or 24.7 per cent over 1908.

A detailed statement showing tonnages and valuations by classes and by assessment districts follows:

Summary of values of iron-ore properties for 1910.

Assessment district.	Active mines.						Reserves and subreserves.						Prospects arbitrary valuation.	Total valuation.
	Class 1 (rate 34.65 cents).	Class 2 (rate 31.50 cents).	Class 3 (rate 28.35 cents).	Class 4 (rate 24.15 cents).	Class 5 (rate 19.95 cents).	Class 6 (rate 14.70 cents).	Class 1 (rate 22.05 cents).	Class 2 (rate 18.90 cents).	Class 3 (rate 15.75 cents).	Class 4 (rate 11.55 cents).	Class 5 (rate 10.50 cents).	Class 6 (rate 8.40 cents).		
St. Louis County:														
Alice village											$114,902	$1,660,589	$21,525	$1,796,916
Aurora village				$717,896	$284,069	$259,449					583,765		42,000	1,887,179
Biwabik town	$400,363			500,564	112,690	642,398					490,467		27,038	2,173,520
Biwabik village	797,259					20,251					262,500			1,080,010
Breitung town				218,153										218,153
Buhl village						294,000			$4,994,617		1,846,563	992,827	1,311	8,129,318
Chisholm village				5,766,822	366,811	6,728,333				$80,616	1,751,425	969,381		15,663,388
Clinton town													500	500
Ely city				1,607,216									1,050	1,608,266
Eveleth city				11,612,833								18,183	1,050	11,632,066
Fayal town			$3,479,967			78,821					201,500			3,760,288
Great Scott town						796,651					572,392	806,477	40,162	2,215,682
Hibbing village		9,796,483		11,146,843	908,098	3,049,735	$25,645,328		1,260,000		6,619,253	742,458		59,168,198
McKinley village						27,664							2,100	29,764
Mesaba town					34,559	225,069					59,284	190,634	1,050	510,596
Mesaba village												110,152		110,152
Missabe Mount'n town			7,164,975	1,863,458	1,083,427	1,265,844	727,650		4,281,370	6,874	617,178		1,050	17,011,826
Morse town				243,435										243,435
Mountain Iron village		6,993,072		1,190,242	838,161	206,047		$35,702	498,463	21,679	301,383	60,577		10,145,326
Nichols town				1,092,698	60,668				1,788,211		52,500	276,378	1,302	3,271,754
Sparta village									244,021					244,021
Stuntz town	$17,327,870		586,219	2,377,537	5,413,337	1,819,879	2,083,921		2,005,322	233,153	7,870,735	7,037,508	595,875	46,851,356
Unorganized, 58½-17				556,119										556,119
Virginia city									5,279,952		3,250,139	1,060,874	5,250	9,596,215
White town				139,262					2,366,234		1,713,720	2,391,379		6,610,595
Wourri town												73,936		73,936
Total	17,327,870	17,987,177	11,231,161	39,033,078	9,101,820	15,414,131	28,456,899	35,702	22,718,190	342,322	25,807,606	16,391,350	741,263	204,588,569
Itasca County:														
Arbo town												69,481	10,500	79,981
Bass Brook town												280,254	47,250	327,504
Calumet village												15,245		15,245
Coleraine village											1,576,375	1,708,954		3,285,329
Grand Rapids town												215,212	7,874	223,086

Summary of values of iron-ore properties for 1910—Continued.

Assessment district.	Active mines.						Reserves and subreserves.						Prospects arbitrary valuation.	Total valuation.
	Class 1 (rate 34.65 cents).	Class 2 (rate 31.50 cents).	Class 3 (rate 28.35 cents).	Class 4 (rate 24.15 cents).	Class 5 (rate 19.95 cents).	Class 6 (rate 14.70 cents).	Class 1 (rate 20.05 cents).	Class 2 (rate 18.90 cents).	Class 3 (rate 15.75 cents).	Class 4 (rate 11.55 cents).	Class 5 (rate 10.50 cents).	Class 6 (rate 8.40 cents).		
Itasca County—Continued.														
Nashwauk town					$273,731						$521,508	$255,178	$18,900	$1,069,317
Nashwauk village						$1,412,197						114,864	14,700	1,541,761
Taconite village											506,371	857,393		1,363,764
Total					1,403,101	1,412,197					3,862,645	9,897,789	102,007	16,677,739
Grand total	$17,327,870	$17,987,177	$11,231,161	$39,033,078	10,504,921	16,826,328	$28,456,899	$35,702	$22,718,190	$342,322	29,670,251	26,289,139	843,270	221,266,308

Summary of tonnages for 1910.

Assessment district.	Active mines.						Reserves and subreserves.						Total Tonnage.
	Class 1 (rate 34.65 cents).	Class 2 (rate 31.50 cents).	Class 3 (rate 28.35 cents).	Class 4 (rate 24.15 cents).	Class 5 (rate 19.95 cents).	Class 6 (rate 14.70 cents).	Class 1 (rate 22.05 cents).	Class 2 (rate 18.90 cents).	Class 3 (rate 15.75 cents).	Class 4 (rate 11.55 cents).	Class 5 (rate 10.50 cents).	Class 6 (rate 8.40 cents).	
St. Louis County:													
Alice village											1,093,353	19,768,915	20,862,268
Aurora village				2,972,655	1,423,905	1,764,958					5,559,655		11,721,173
Biwabik town		1,270,995		2,072,728	564,862	4,370,051					4,671,114		12,949,750
Biwabik village		2,530,980				137,764					2,500,000		5,168,744
Brutung town				903,326									903,326
Buhl village						2,000,000			31,711,858		17,586,306	11,819,376	63,117,540
Chisholm village				23,879,181	1,838,652	45,770,964				697,970	16,680,243	11,540,257	100,407,267
Clinton town													
Ely city				6,655,141									6,655,141
Eveleth city				48,086,269								216,460	48,302,729
Fayal town			12,275,016			536,197					1,919,040		14,730,253
Great Scott town						5,419,394					5,451,354	9,600,913	20,471,661
Hibbing village		31,099,952		46,156,700	4,551,869	20,746,498	116,305,341		8,000,000		63,126,218	8,838,793	298,825,371
McKinley village						188,125							188,125
Mesaba town					173,226	1,631,078					564,608	2,269,456	4,638,368
Mesaba village												1,311,329	1,311,329

Missabe Mountain town			25,273,275	7,716,133	5,430,711	8,611,190	3,300,000		27,183,297	59,517	5,877,879		83,452,057
Morse town				1,008,013									1,008,013
Mountain Iron village		22,200,229		4,928,540	4,201,311	1,401,676		188,898	3,164,849	187,696	2,870,312	721,153	39,864,664
Nichols town				4,524,630	304,098				11,353,721		500,000	3,290,177	19,972,626
Sparta village									1,549,338				1,549,338
Stuntz town	50,008,286		2,067,793	9,344,875	27,134,522	12,380,131	9,450,891		12,732,201	2,018,650	70,197,490	83,779,882	279,614,721
Unorganized, 58½-17				2,302,771									2,302,771
Virginia city									33,523,508		30,953,707	12,629,456	77,106,671
White town				576,653					15,023,712		16,321,158	28,468,825	60,390,348
Wourri town												924,206	924,206
Total	50,008,286	57,102,156	39,616,084	161,627,670	45,623,156	104,858,026	129,056,232	188,898	144,242,484	2,963,833	245,872,437	195,179,198	1,176,338,460
Itasca County:													
Arbo town												827,156	827,156
Bass Brook town												3,336,368	3,336,368
Calumet village												181,484	181,484
Coleraine village											15,013,096	20,344,690	35,357,786
Grand Rapids town												2,562,044	2,562,044
Greenway town											487,342	3,980,332	4,467,674
Keewatin village					5,661,001							29,819,844	35,480,845
Marble village											11,497,333	42,166,621	53,663,954
Nashwauk town					1,372,085						4,966,742	3,037,839	9,376,666
Nashwauk village						9,606,775						1,367,442	10,974,217
Taconite village											4,822,583	10,207,054	15,029,637
Total					7,033,086	9,606,775					36,787,096	117,830,874	171,257,831
Grand total	50,008,286	57,102,156	39,616,084	161,627,670	52,656,242	114,464,801	129,056,232	188,898	144,242,484	2,963,833	282,659,533	312,010,072	1,347,596,291

Summary of tonnages and valuations by classes, 1910.

	Class.	Tonnage.	Rate.[1]	Valuation.
Mines	1	50,008,286	34.65	$17,327,870
	2	57,102,156	31.50	17,987,177
	3	39,616,064	28.35	11,231,161
	4	161,627,670	24.15	39,033,078
	5	52,056,242	19.95	10,504,921
	6	114,464,801	14.70	16,826,328
Reserves and subreserves	1	129,056,232	22.05	28,456,909
	2	188,898	18.90	35,702
	3	144,242,484	15.75	22,718,190
	4	2,963,533	11.55	342,322
	5	282,659,533	10.50	29,670,251
	6	813,010,072	8.40	26,289,139
Acreage prospects				843,270
Total		1,347,596,291		221,266,308
Other lands in iron belt				3,403,537
Total assessment				224,669,845

[1] Five per cent increase over 1909 in all classes.

The total assessment for 1910 was distributed as follows:

St. Louis County	$206,869,908
Itasca County	17,799,937
	224,669,845

The following is a comparative summary of tonnages and tonnage valuations, together with the assessed valuation of other lands in the iron-ore belt and the total assessed values for the years 1906 to 1910, inclusive:

Comparative summary of tonnages and valuations, 1906–1910.

Years.	Total tonnages.	Valuation tonnage.	Valuation other lands.	Total valuation.
1906[1]				$64,486,409
1907	1,191,969,757	$186,085,290	$5,621,392	191,706,682
1908	1,193,188,959	174,263,632	5,947,061	180,210,693
1909	1,310,190,194	199,008,838	5,517,301	204,526,139
1910	1,347,596,291	220,423,038	4,246,807	224,669,845

[1] No tonnage estimates.

Average assessed value per ton.—The following table shows the tonnage and valuation of mines and reserves separately, and the average assessed value per ton for the years 1907, 1808, 1909, and 1910:

Average assessed value per ton of mines and reserves, 1907–1910.

Year.	Mines.			Reserves.		
	Tonnage.	Valuation.	Average per ton.	Tonnage.	Valuation.	Average per ton.
1907	470,966,410	$105,331,911	22.4	721,003,347	$80,753,379	11.2
1908	370,934,884	84,019,472	22.9	822,254,075	90,254,160	11
1909	404,003,095	90,497,473	22.4	906,187,099	108,511,365	11.9
1910	475,475,239	112,910,535	23.8	872,121,052	107,512,503	11.3

The foregoing summaries of assessed values do not include the assessed value of stock piles or the other personal property assessment of the various mining companies and mine operators, which amounts approximately to $4,500,000 annually.

Ore shipments.—The following table gives the ore shipments from St. Louis and Itasca Counties for the past five years:

	Tons.
1906	25,611,384
1907	29,180,975
1908	18,098,894
1909	29,284,496
1910	30,308,588

State mineral leases.—Under chapter 14, Laws of 1907, the provisions of law relating to the issuing of permits to explore State lands for minerals were repealed.

No mineral leases have been issued since February 13, 1908. Up to that date a total of 872 mineral leases had been issued by the State, of which number 276[1] were still in force when the last assessment was made, May 1, 1910. Of this number tonnages have been developed on only 49 leases. The total payments received by the State from mineral leases and contracts and royalty on iron ore to August 1, 1910, amounted to $1,902,780.12.

The following table shows the number of State mineral leases upon which tonnages have been actually developed on the different classes of State lands, the estimated tonnage and the assessed value of the same.

Tonnage and assessed value of 49 State mineral leases, 1910.

	Number of leases.	Tonnage.	Assessed value.
School lands	34	105,294,969	$13,460,239
University lands	7	8,844,871	857,505
Swamp lands	8	31,059,977	2,717,568
Total	49	145,199,817	17,035,312

Conclusion.—Since the organization of the tax commission in 1907, the assessed value of mineral lands has increased from $64,486,409 to $224,669,845, a gain of $160,183,436, or 248 per cent, in four years. In 1906 the assessed value of mineral properties represented 8.5 per cent of the total real estate assessment of the entire State, while in 1910 it had increased to 22.2 per cent of the total. This large increase is due in part to the opening up of new mines and to the development of new tonnages by explorations, and in part to the comprehensive method inaugurated and followed by the commission of ascertaining and verifying tonnages and values for purposes of taxation.

It has been the policy of the commission to keep in close touch at all times with development work on the iron ranges. We are thus enabled to keep fully informed of new discoveries and new tonnages, of changes from reserves to active mines, and of many other matters of importance affecting mineral values. Our records contain complete data of each 40-acre tract of land in the iron-ore belt and when drilled or test-pitted show grades, tonnages, classification, and assessed values. Mining companies and owners of mineral properties that have been explored readily respond to our requests for information relating to their properties, and in nearly every case furnish us with blue prints showing explorations and analyses of ore samples, for which courtesy we here desire to make due acknowledgment.

We believe that the commission has the mining situation well in hand and that the method adopted of classifying and valuing the various mineral properties and of verifying tonnage estimates and grades enables us to determine values with a reasonable degree of accuracy and to equitably assess the great iron-ore deposits of the State as rapidly as explorations furnish us with the necessary data.

[1] Forty-two of these were canceled Nov. 1, 1910.

THE BASIS OF VALUATION.

The most embarrassing matter connected with the administration of the existing tax laws of this State is that of the valuation of taxable property. Before the adoption of the "wide-open" amendment of 1906 the constitution provided that property should be taxed "according to its true value in money." The statutes (sec. 810, Revised Laws, 1905) enacted prior to the amendment provide that "all property shall be assessed at its true and full value in money." The adoption of the constitutional amendment renders it unnecessary at this time to discuss whether the words "according to" in the constitution as it was are synonymous with the word "at" in the statute; that is, whether an assessment of property must necessarily be "at" its true value in order to be "according to" that value. While the amended constitution provides merely that "taxes shall be uniform upon the same class of subjects," it is silent upon the matter of assessment. But the statute remains requiring that property shall be assessed at its "true and full value."

In defiant contrast to this unequivocal mandate of the law is the notorious fact that never since the soil of Minnesota has been taxable has this law been obeyed. Property has not been assessed at its true or full value, nor has any serious attempt ever been made to so assess it. The uniform, universal custom throughout the entire State has been to assess property at from 25 to 50 per cent of its actual value, and this custom has had the long-continued approval of the people, the silent support of the law-making and the acquiescence of the law-enforcing departments of the State government. The truth might as well be frankly acknowledged that it is a dead letter, a stillborn statute unenforced and unenforceable. Any attempt to comply with its provisions would be revolutionary and so contrary to the fixed and uniform custom of a half century that it would arouse the opposition and indignation of the people.

The commission's recommendation to the last legislature.—In its report two years ago this commission called the attention of the legislature to the matter and formulated and recommended a bill providing that property subject to the general property tax should be valued at its true and full value, which should be entered opposite each item on the assessment rolls, and should be assessed at 50 per cent of such true and full value. Such assessed value should in all cases be construed and taken as the value of such property for purposes of taxation, and should be the values upon which the tax levy should be made.

The phraseology of this bill is peculiar. At the time it was prepared the validity of the constitutional amendment was pending in the supreme court, and it was deemed prudent in order to meet the possibility that the amendment might be declared invalid to make the bill harmonize with the provisions of the constitution requiring property to be "taxed according to its true value in money," the theory being that if property was assessed at a fixed percentage of its full value such assessment, being upon the basis of, would therefore be "according to" such value. While not satisfied of the correctness of this theory, the commission deemed it best to give it a trial in order to relieve a situation almost intolerable.

This bill also closely followed the law of Iowa providing that "all property subject to taxation shall be valued at its actual value, which shall be entered opposite each item, and shall be assessed at 25 per cent of such actual value." The commission at that time, in view of the doubt then existing as to the adoption of the constitutional amendment, deemed it wise to follow the precedent set in other States and accept the form of statute which had there been tested in the courts.

Action by the legislature.—This bill was amended in the legislature by reducing the specified percentage from 50 to 40 per cent and in that condition was ultimately defeated. But the legislature, recognizing the embarrassments of the situation, passed the following concurrent resolution, viz:

"*Be it resolved by the senate, the house of representatives concurring:* That, whereas the basis of valuation of property for taxation in this State has actually been other than its true value, and the financial affairs of the various counties, municipalities, and State institutions have been regulated so as to accord with the present taxable valuation of property; and

"Whereas there is legislation pending looking to the establishment of a more uniform basis of actual valuation for taxation, and such a basis would affect the affairs of State institutions, municipalities, and counties: Therefore be it resolved by the senate, the house of representatives concurring:

"That the State tax commission be, and it hereby is, requested to take into consideration in any regulation it may make as to the valuation of property for taxation the values which have heretofore been given such property, and that the commission so act as not to create any radical changes in the present assessed valuation, such as would derange the relations which have been created and now exist between the incomes and salaries paid by different institutions, municipalities, and public offices throughout the State, and thereby allow the present relative values to continue until the next session of the legislature."

In conformity with this resolution the commission in its equalization of assessments in 1909 and 1910 made no departure from the custom so long in vogue.

An embarrassing situation.—The troublesome condition again confronts us and is productive of increasing embarrassment in every direction. Letters from local assessors and county officers are constantly being received asking for instructions or suggestions as to what percentage should be used in the valuation of property for taxation. The only reply which the commission has been able to make was to call attention to the statute prescribing that property should be assessed at its full value and to the legislative resolution requesting that it should not be so assessed.

Necessity for immediate action.—We earnestly protest that the matter should no longer be left in the chaotic and contradictory condition in which it is at the present time. Either a firm and strenuous effort should be made to raise all assessments to the full value of the property assessed, or provision should be made by law providing for its assessment at some specified per cent of such value, or all the provisions of the statutes (there are many such besides sec. 810, Revised Laws, 1905) should be repealed, leaving the whole matter in the discretion of the tax commission. The situation should be squarely met and the question solved without evasion or further delay. The adoption of the constitutional amendment leaves the whole matter to the judgment of the legislature, unfettered by limitations or restrictions.

In the opinion of the commission it is easier and better to make the laws conform to the long-established and unbroken custom of the people than by drastic legislation to attempt to make the custom conform to a discredited and ignored statute.

Reasons for proposed change.—There are three principal reasons why the assessment of taxable property should be put at a certain percentage of instead of at its full value, viz:

First. The indebtedness of towns, cities, and villages and the salaries of certain county officers are limited and determined by certain fixed percentages of the assessed valuation of the district affected. To arbitrarily increase and more than double this assessed valuation would result in largely increasing the debt limit in such municipalities and automatically raising and in some cases more than doubling such salaries.

Second. Certain special fixed tax levies for school and other State purposes are likewise based upon the annual assessment of property in the State, and would if such assessment were raised to full value enormously increase the taxes paid by the people and the revenues received for those specific purposes. The debt limitations, salaries, and special-tax rates above mentioned were fixed and based upon the customary method of assessment prevailing throughout the State when they were enacted, and not upon the full-value assessment required by law.

Third. A fixed percentage of true value and not the full value itself conforms to the custom and habit which has prevailed in this State for the past half century.

Recommendations.—The important thing is that this matter should be definitely settled by law. This commission has no hesitancy in recommending that the assessment be placed upon the fixed basis of 50 per cent of the full value. It believes that such basis can substantially be maintained throughout the entire State. It has therefore reformulated and hereby submits and recommends the passage of the bill designated as Exhibit A in the appendix to this report. The commission is not in favor of merely repealing the true and full value provisions in the statutes, and leaving them silent upon the subject. The effect of such proceeding would be practically to leave the basis of the assessment of property in the hands of the tax commission without any restrictions or limitations whatever. The commission does not seek and should not be given any such broad and undefined powers.

Nor is the commission in favor of attempting to enforce the provisions of existing law. It fully realizes the annoyances, difficulties, and evil effects which must necessarily attend any such action on its part. It recognizes the fact that such proceeding would be revolutionary and so antagonistic to established custom as to be productive of great popular dissatisfaction.

But if the legislature shall be of the opinion that the existing law shall remain unchanged and that assessments shall be made at the full and true value of the property assessed, the commission will reluctantly but in good faith endeavor to enforce the law as it is left by the legislature regardless of its effect upon the debt limit, the salaries, and special taxes and popular disapproval above mentioned.

We leave the subject to the wisdom and the courage of the legislature.

IRON ORE, PIG IRON, AND STEEL.

By Ernest F. Burchard.

INTRODUCTION.

Although the iron and steel industry in the United States in 1910 broke all previous records by a small margin, the total volume of business was not as great as was anticipated at the beginning of the year. The recovery in 1909 from the depression of 1908 was so rapid that preparations for much larger productions of iron ore and pig iron in 1910 were made than were necessary; consequently there was an overproduction, and a gradual depression marked the close of the year. The curve showing pig iron production by months (see fig. 2) affords a graphic index of the trend of the pig-iron industry from the beginning to the end of the year and also a comparison of the conditions in 1910 with those in 1907, 1908, and 1909. From the beginning of the year there was a steady decline in production, with the exception of small rallies in March and October, neither of which brought the production up to that indicated at the beginning of the preceding month. The daily production for December, 1910, averaged about 57,000 tons, as compared with 85,000 tons in December, 1909. The production for December, 1910, was thus down nearly to the level of that for December, 1908. On December 31, 1910, there were 206 furnaces in blast out of a total of 473; on the same date in 1909 there were 338 furnaces in blast out of a total of 469. As a consequence of the active demand the iron-ore output exceeded that of 1909 by 5,734,297 long tons, and that of 1907, which was previously the record year, by 5,169,115 tons. The total quantity of iron ore marketed in 1910, for the purpose of making pig iron—that is, not including stocks left at mines nor iron ore used for fluxing other metallic ores nor in the manufacture of paints—was 56,889,734 long tons, as compared with 51,155,437 tons in 1909 and with 35,924,771 tons in 1908; the output of pig iron in 1910 was 27,303,567 long tons, as compared with 25,795,471 tons in 1909 and with 15,936,018 tons in 1908.

The ore reported as having been used for fluxing other metallic ores during 1910 amounted to 125,172 long tons, valued at $446,996, as compared with 118,892 long tons in 1909, valued at $297,594. The quantity of iron ore sold by the miners for paint during 1910 was reported as 14,798 long tons, valued at $40,101. Prices of iron and steel products in 1910 were at their highest levels at the beginning of the year, but they began to decline early in February, and practically everything but rails declined steadily until August or later, some of the products selling at the lowest prices in December. The following price reductions per ton occurred from the first week in January to

December 1:[1] Bessemer pig iron, $2; basic pig iron, $3.75; Bessemer billets, $5; open-hearth billets, $6; wire nails, $3; cut nails, $4, etc.

The increase in the production of iron ore in 1910 over that of 1909 was 11.21 per cent, and the increase in the production of pig iron and steel was about 5.85 per cent and 8.93 per cent, respectively.

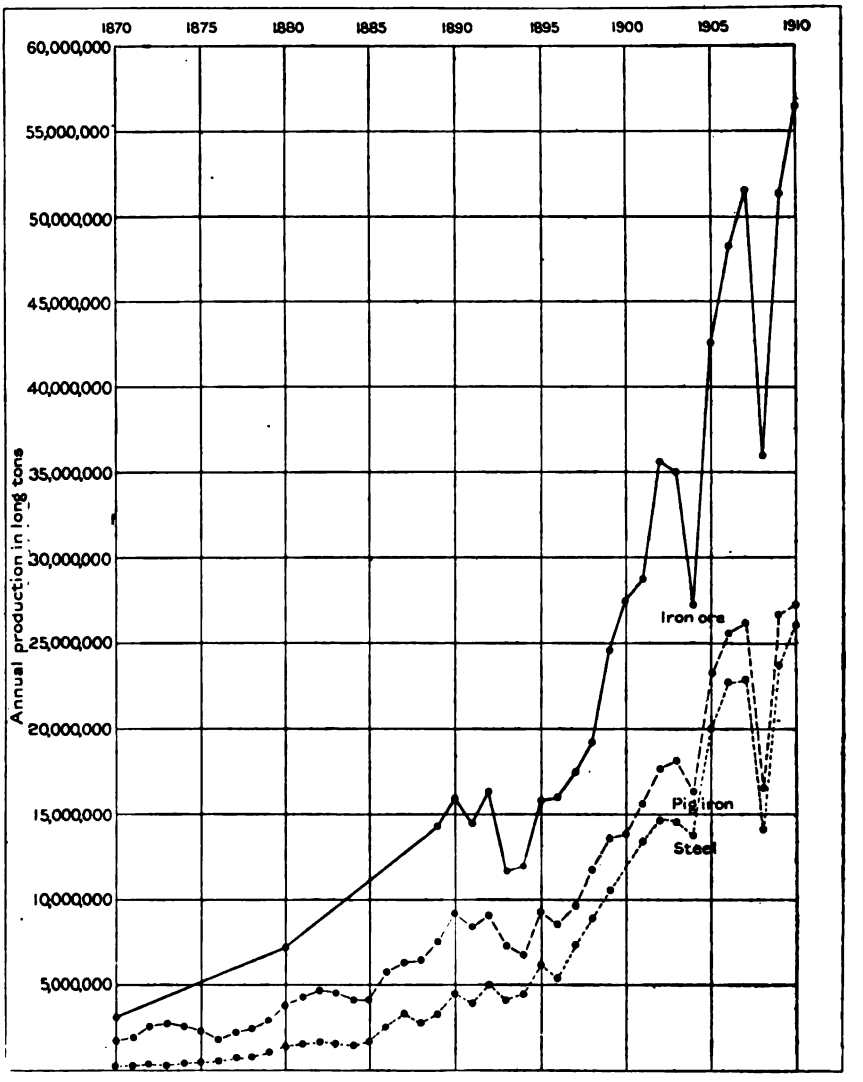

FIGURE 1.—Curve showing the production of iron ore, pig iron, and steel in the United States, 1870–1910, in long tons.

Figure 1 shows graphically the production of iron ore, pig iron, and steel since 1870, and illustrates the major fluctuations that have occurred.

[1] Iron Trade Review, Jan. 5, 1911.

IRON-ORE INDUSTRY OF THE UNITED STATES.

PRODUCTION OF IRON ORE BY COMMERCIAL DISTRICTS.

The iron ore marketed in the United States in 1910 amounted to 56,889,734 long tons, valued at $140,735,607 at the mines, as compared with 51,155,437 long tons, valued at $109,964,903, produced in 1909. This represents an increase of 11.21 per cent in tonnage and of 27.98 per cent in value. The average price per ton for the whole country in 1910 was $2.47, as compared with $2.15 in 1909.

Iron ore was mined in 28 States during 1910. Of these, four States—Idaho, Montana, Nevada, and Utah—produced ores for fluxing only; part of Colorado's production was for fluxing and part for pig iron; the rest produced ores for blast furnace use.

The various States in which iron ore occurs may be conveniently grouped into six commercial districts, namely:

1. *Northeastern district:* Including Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, and Ohio.
2. *Southeastern district:* Including Maryland, the Virginias, Kentucky, Tennessee, North Carolina, Georgia, and Alabama.
3. *Lake Superior district:* Including Michigan, Wisconsin, and Minnesota.
4. *Mississippi Valley district:* Including Iowa, Missouri, Arkansas, and Texas.
5. *Rocky Mountain district:* Including Idaho, Montana, Wyoming, Colorado, New Mexico, Utah, and Nevada.
6. *Pacific slope district:* Including Washington and California.

Each of these districts may be subdivided into mining districts and the ores classified with regard to variety and to distribution of deposits. These subdivisions are discussed in another section. The Lake Superior is by far the most important of these districts, and is followed in order by the southeastern district and the northeastern district; the Mississippi Valley and the western districts are of minor importance. The following table shows the relative output of iron ore in each of the commercial districts during 1908, 1909, and 1910:

Production of iron ore in the United States, by commercial districts, in 1908, 1909, and 1910, in long tons.

District.	1908.		1909.		1910.	
	Quantity.	Percentage of total.	Quantity.	Percentage of total.	Quantity.	Percentage of total.
Northeastern	1,590,098	4.42	2,280,741	4.46	2,605,318	4.58
Southeastern	5,484,821	15.27	6,197,717	12.11	6,894,464	12.12
Lake Superior	28,225,412	78.57	41,942,969	81.99	46,420,226	81.60
Mississippi Valley	154,380	.43	96,428	.19	107,876	.19
Rocky Mountain	470,060	1.31	637,582	1.25	861,850	1.51
Pacific slope	(a)	.....	(a)	.....	(a)	.....
Total	35,924,771	100.00	51,155,437	100.00	56,889,734	100.00

a Pacific slope included in Rocky Mountain district.

PRODUCTION OF IRON ORE BY STATES.

The following table gives a comparison of the iron-ore production, by States, for 1909 and 1910, showing increase and decrease and the percentage of increase and decrease in the several States:

Quantity and value of iron ore produced in the United States, 1909 and 1910, by States.

State.	1909.		1910.		Increase (+) or decrease (−) in 1910.		Percentage of increase (+) or decrease (−) in 1910.	
	Quantity, in long tons.	Value.	Quantity, in long tons.	Value.	Quantity, in long tons.	Value.	Quantity.	Value.
Alabama	4,321,252	$4,996,455	4,801,275	$6,083,722	+ 480,023	+$1,087,267	+ 11.11	+ 21.76
California,[a] Colorado, New Mexico, Washington, and Wyoming	637,582	646,082	861,850	877,223	+ 224,268	+ 231,141	+ 35.17	+ 35.78
Connecticut and Massachusetts	38,272	141,274	34,158	121,306	− 4,114	− 19,968	− 10.75	− 14.13
Georgia	221,016	332,478	313,878	482,659	+ 92,862	+ 150,181	+ 42.02	+ 45.17
Kentucky and West Virginia	74,769	110,287	64,347	86,085	− 10,422	− 24,202	− 13.94	− 21.94
Maryland	23,888	46,786	14,062	29,105	− 9,826	− 17,681	− 41.13	− 37.79
Michigan	11,900,384	32,282,622	13,303,906	41,393,585	+1,403,522	+ 9,110,963	+ 11.79	+ 28.22
Minnesota	28,975,149	60,253,314	31,966,769	78,462,560	+2,991,620	+18,209,246	+ 10.32	+ 30.22
Missouri	89,954	210,853	78,341	168,697	− 11,613	− 42,156	− 12.91	− 19.99
New Jersey	543,720	1,607,003	521,832	1,582,213	− 21,888	− 24,790	− 4.03	− 1.54
New York	1,015,333	3,072,323	1,287,209	3,848,683	+ 271,876	+ 776,360	+ 26.78	+ 25.27
North Carolina	61,150	107,013	65,278	114,237	+ 4,128	+ 7,224	+ 6.75	+ 6.75
Ohio	16,527	28,547	22,320	35,866	+ 5,793	+ 7,319	+ 35.05	+ 25.64
Pennsylvania	666,889	792,672	739,799	911,847	+ 72,910	+ 119,175	+ 10.93	+ 15.03
Tennessee	657,795	907,282	732,247	1,048,323	+ 74,452	+ 141,041	+ 11.32	+ 15.55
Texas	6,474	9,318	29,535	34,003	+ 23,061	+ 24,685	+356.20	+264.92
Virginia	837,847	1,693,188	903,377	1,845,144	+ 65,530	+ 151,956	+ 7.82	+ 8.97
Wisconsin	1,067,436	2,727,406	1,149,551	3,610,349	+ 82,115	+ 882,943	+ 7.69	+ 32.37
Total	51,155,437	109,964,903	56,889,734	140,735,607	+5,734,297	+30,770,704	+ 11.21	+ 27.98

[a] No production from California in 1909.

In the following table the States are arranged according to their rank as producers in 1909 and 1910, with regard to both the quantity and the value of the iron ore produced:

Rank of iron-ore producing States in 1909 and 1910, with quantity and value of product and percentage of each.

1909.

Rank.	State.	Production. Quantity, in long tons.	Production. Percentage of total production.	Rank.	State.	Value. Amount.	Value. Percentage of total value.
1	Minnesota	28,975,149	56.64	1	Minnesota	$60,253,314	54.79
2	Michigan	11,900,384	23.26	2	Michigan	32,282,622	29.36
3	Alabama	4,321,252	8.45	3	Alabama	4,996,455	4.54
4	Wisconsin	1,067,436	2.09	4	New York	3,072,823	2.79
5	New York	1,015,333	1.98	5	Wisconsin	2,727,406	2.48
6	Virginia	837,847	1.64	6	Virginia	1,693,188	1.54
7	Pennsylvania	666,889	1.30	7	New Jersey	1,607,003	1.46
8	Tennessee	657,795	1.29	8	Tennessee	907,282	.83
9	Colorado, New Mexico, Washington, and Wyoming	637,582	1.25	9	Pennsylvania	792,672	.72
10	New Jersey	543,720	1.06	10	Colorado, New Mexico, Washington, and Wyoming	646,082	.59
11	Georgia	221,016	.43	11	Georgia	332,478	.30
12	Missouri	89,954	.18	12	Missouri	210,853	.19
13	Kentucky and West Virginia	74,769	.15	13	Connecticut and Massachusetts	141,274	.13
14	North Carolina	61,150	.12	14	Kentucky and West Virginia	110,287	.10
15	Connecticut and Massachusetts	38,272	.07	15	North Carolina	107,013	.10
16	Maryland	23,888	.05	16	Maryland	46,786	.04
17	Ohio	16,527	.03	17	Ohio	28,547	.03
18	Texas	6,474	.01	18	Texas	9,318	.01
	Total	51,155,437	100.00		Total	109,964,903	100.00

1910.

1	Minnesota	31,966,769	56.19	1	Minnesota	$78,462,560	55.75
2	Michigan	13,303,906	23.39	2	Michigan	41,393,585	29.41
3	Alabama	4,801,275	8.44	3	Alabama	6,083,722	4.32
4	New York	1,287,209	2.26	4	New York	3,848,683	2.74
5	Wisconsin	1,149,551	2.02	5	Wisconsin	3,610,349	2.57
6	Virginia	903,377	1.59	6	Virginia	1,845,144	1.31
7	California, Colorado, New Mexico, Washington, and Wyoming	861,850	1.52	7	New Jersey	1,582,213	1.12
8	Pennsylvania	739,799	1.30	8	Tennessee	1,048,323	.75
9	Tennessee	732,247	1.29	9	Pennsylvania	911,847	.65
10	New Jersey	521,832	.92	10	California, Colorado, New Mexico, Washington, and Wyoming	877,223	.62
11	Georgia	313,878	.55	11	Georgia	482,559	.34
12	Missouri	78,341	.14	12	Missouri	168,697	.12
13	North Carolina	65,278	.11	13	Connecticut and Massachusetts	121,306	.09
14	Kentucky and West Virginia	64,347	.11	14	North Carolina	114,237	.08
15	Connecticut and Massachusetts	34,158	06	15	Kentucky and West Virginia	86,085	.06
16	Texas	29,535	.05	16	Ohio	35,866	.03
17	Ohio	22,320	.04	17	Texas	34,003	.02
18	Maryland	14,062	.02	18	Maryland	29,105	.02
	Total	56,889,734	100.00		Total	140,735,607	100.00

PRODUCTION OF IRON ORE BY VARIETIES BY STATES AND MINING DISTRICTS.

Iron minerals are classified as sulphides, oxides, carbonates, silicates, etc., of which only the oxides and the carbonates are used in the iron and steel industry, except a very small quantity of by-product from sulphide ores used in acid manufacture. The ores of iron are generally classed under four heads:

1. *Hematite.*—Including all the anhydrous sesquioxides (Fe_2O_3—theoretical percentage of iron, 70). This is known locally as red hematite, specular ore, gray ore, fossil ore, oolitic ore, etc.

2. *Brown ore.*—Including hydrated sesquioxides, such as limonite, göthite, and turgite ($Fe_2O_3nH_2O$—theoretical percentage of iron, 59.8–66). This is known locally as brown iron ore, brown hematite, bog ore, limonite, etc.

3. *Magnetite.*—Including magnetic oxides (Fe_3O_4—theoretical percentage of iron, 72.4). Magnetite is known generally as magnetic iron ore.

4. *Iron carbonate.*—Including carbonates of various types ($FeCO_3$—theoretical percentage of iron, 48.2). Iron carbonate is known locally as spathic iron ore, kidney ore, black band ore, siderite, etc.

Hematite has always been predominant as an ore of iron, and at present constitutes almost nine-tenths of the iron ore produced. Brown ore and magnetite are far below it in importance; each furnishes at present about one-twentieth of the total iron-ore production. The production of iron carbonate is insignificant in comparison with that of the other ores; it constitutes only about one-thirtieth of 1 per cent of the total.

In the following table are shown the quantities of each of the classes of iron ores produced in the various States during 1909 and 1910:

Production of iron ore in the United States in 1909 and 1910, by States and varieties, in long tons.

1909.

State.	Hematite.	Brown ore.	Magnetite.	Carbonate.	Total quantity.
Alabama	3,176,416	1,144,836	.....	.....	4,321,252
Colorado, New Mexico, Washington, and Wyoming	542,744	15,000	79,838	.....	637,582
Connecticut and Massachusetts	.....	38,272	.....	.....	38,272
Georgia	9,521	211,495	.....	.....	221,016
Kentucky and West Virginia	45,000	29,769	.....	.....	74,769
Maryland	.....	23,888	.....	.....	23,888
Michigan	11,900,384	.....	.....	.....	11,900,384
Minnesota	28,975,149	.....	.....	.....	28,975,149
Missouri	67,391	22,563	.....	.....	89,954
New Jersey	.....	(a)	a 543,720	.....	543,720
New York	53,187	.....	962,146	.....	1,015,333
North Carolina	.....	.....	61,150	.....	61,150
Ohio	.....	.....	.....	16,527	16,527
Pennsylvania	5,144	80,715	581,030	.....	666,889
Tennessee	298,818	358,977	.....	.....	657,795
Texas	.....	6,474	.....	.....	6,474
Virginia	72,955	762,937	1,955	.....	837,847
Wisconsin	1,061,931	5,505	.....	.....	1,067,436
Total	46,208,640	2,700,431	2,229,839	16,527	51,155,437

a Brown ore is included in magnetite.

Production of iron ore in the United States in 1909 and 1910, by States and varieties, in long tons—Continued.

1910.

State.	Hematite.	Brown ore.	Magnetite.	Carbonate.	Total quantity.
Alabama	3,678,139	1,123,136	.....	.....	4,801,275
California, Colorado, New Mexico, Washington, and Wyoming	656,629	15,975	189,246	.....	861,850
Connecticut and Massachusetts	.....	34,158	.....	.....	34,158
Georgia	60,324	253,554	.....	.....	313,878
Kentucky and West Virginia	47,493	16,854	.....	.....	64,347
Maryland	.....	14,062	.....	.....	14,062
Michigan	13,303,906	.....	.....	.....	13,303,906
Minnesota	31,966,769	.....	.....	.....	31,966,769
Missouri	55,832	22,509	.....	.....	78,341
New Jersey	.....	(a)	a 521,832	.....	521,832
New York	64,738	(a)	a 1,222,471	.....	1,287,209
North Carolina	.....	.....	65,278	.....	65,278
Ohio	.....	.....	.....	22,320	22,320
Pennsylvania	846	106,544	632,409	.....	739,799
Tennessee	301,838	430,409	.....	.....	732,247
Texas	.....	29,535	.....	.....	29,535
Virginia	81,647	821,131	599	.....	903,377
Wisconsin	1,148,846	705	.....	.....	1,149,551
Total	51,367,007	2,868,572	2,631,835	22,320	56,889,734

a Brown ore is included in magnetite.

From this table it will be seen that the great bulk of the hematite comes from the Lake Superior district (Michigan, Minnesota, and Wisconsin) and Alabama, the brown ore from the Appalachian States, and the magnetite from New York, New Jersey, and Pennsylvania. All the iron carbonate is obtained from Ohio. On a later page is given the production of the principal ranges in the Lake Superior district. In the report for 1909 the production was given for the first time of two important southern mining centers, the Birmingham and the Chattanooga districts. In the Birmingham district are included, besides the mines in the immediate vicinity of Birmingham, those in eastern Alabama that ship ores to the furnaces at Birmingham. In the Chattanooga district are included those mines that ship ores to Chattanooga, Tenn., to Rome, Ga., and to Gadsden and Attalla, Ala. The brown ore mines near Russellville, Ala., and in west-central Tennessee are not included in either district.

The following table presents the production of iron ore in the principal mining districts and by varieties during 1910:

Production of iron ore in the United States, by mining districts and varieties, in 1910, in long tons.

District.	Hematite.	Brown ore.	Magnetite.	Carbonate.	Total.
Lake Superior	46,328,743	.....	.....	.....	46,328,743
Birmingham	3,300,433	501,682	.....	.....	3,802,115
Chattanooga	712,817	500,742	.....	.....	1,213,559
Adirondack	(a)	.....	a 1,146,080	.....	1,146,080
Northern New Jersey and southeastern New York	.....	(b)	b598,601	.....	598,601
Other	1,018,636	1,866,148	893,532	22,320	3,800,636
Total	51,360,629	2,868,572	2,638,213	22,320	56,889,734

a Hematite is included in magnetite. b Brown ore is included in magnetite.

TOTAL PRODUCTION OF IRON ORE.

In the following table is shown the production of various types of iron ore in the United States as far as has been recorded. The statistics from 1889 to the present were collected by the United States Geological Survey; those for 1860, 1870, and 1880 were collected for the census reports of those years; those for 1875 and 1881 were estimated by I. L. Bell;[1] and those from 1882 to 1888, inclusive, were estimated by James M. Swank[2] from the pig-iron production. No figures can be obtained for the production of various classes of iron ores prior to 1889, except for the census year 1880.

Production of iron ore in the United States, 1860–1910, in long tons.

Year.	Hematite.	Brown ore.	Magnetite.	Carbonate.	Total.
1860					2,873,460
1870					[a] 3,831,891
1875					4,017,857
1880	2,243,993	1,918,622	2,134,276	823,471	7,120,362
1881					7,119,643
1882					[b] 8,700,000
1883					[b] 8,800,000
1884					[b] 7,718,120
1885					[b] 7,600,000
1886					[b] 10,000,000
1887					[b] 11,300,000
1888					[b] 12,062,530
1889	9,056,288	2,523,087	2,506,415	432,251	14,518,041
1890	10,527,650	2,559,938	2,570,838	377,617	16,036,043
1891	9,327,398	2,757,564	2,317,108	189,108	14,591,178
1892	11,646,619	2,485,101	1,971,965	192,981	16,296,666
1893	8,272,637	1,849,272	1,330,886	134,834	11,587,629
1894	9,347,434	1,472,748	972,219	87,278	11,879,679
1895	12,513,995	2,102,358	1,268,222	73,039	15,957,614
1896	12,576,288	2,126,212	1,211,526	91,423	16,005,449
1897	14,413,318	1,961,954	1,059,479	83,295	17,518,046
1898	16,150,684	1,989,681	1,237,978	55,373	19,433,716
1899	20,004,399	2,869,785	1,727,430	81,559	24,683,173
1900	22,708,274	3,231,089	1,537,551	76,247	27,553,161
1901	24,006,025	3,016,715	1,813,076	51,663	28,887,479
1902	30,532,149	3,305,484	1,688,860	27,642	35,554,135
1903	30,328,654	3,080,399	1,575,422	34,833	35,019,308
1904	23,839,477	2,146,795	1,638,846	19,212	27,644,330
1905	37,567,055	2,546,662	2,390,417	21,999	42,526,133
1906	42,481,375	2,781,063	2,469,294	17,996	47,749,728
1907	46,060,486	2,957,477	2,679,067	23,589	51,720,619
1908	31,788,564	[cd] 2,561,825	[c] 1,547,797	26,585	[d] 35,924,771
1909	46,208,640	[cd] 2,700,431	[c] 2,229,839	16,527	[d] 51,155,437
1910	51,367,007	[cd] 2,868,572	[c] 2,631,835	22,320	[d] 56,889,734

[a] Includes ore produced by owners of blast furnaces, estimated by census at 800,000 tons.
[b] Figures given are for consumption of domestic ores. Total production for 1882, 1883, and 1884 is estimated as 9,000,000, 8,400,000, and 8,200,000 tons, respectively. See Mineral Resources U. S. for 1883 and 1884.
[c] Some brown ore included in magnetite.
[d] Ore used for fluxing purposes excluded from productions figures after 1907. In 1910, ore sold for paint excluded from iron-ore production and included in metallic paint.

In the following table the production of iron ore in the United States is shown from 1810 to 1869, and by decades from 1870 to 1909. The figures for the years previous to 1889 were calculated from the pig-iron production and include imported ore as well as domestic ore used. Ore used for flux has been deducted from the production in 1908 and 1909.

[1] Bell, I. L., Principles of the manufacture of iron and steel, 1884, p. 451.
[2] Mineral Resources U. S., 1882 to 1888.

Production of iron ore in the United States from 1810 to 1909, by decades, and rate of increase.

Decade.	Quantity in long tons.	Percentage of increase.	Decade.	Quantity, in long tons.	Percentage of increase.
1810–1869	49,656,000	.....	1890–1899	163,989,193	80.1
1870–1879	44,570,527	.....	1900–1909 a	383,735,101	134.0
1880–1899	91,043,854	104.3			

a Iron ore used for flux excluded from production for 1908 and 1909.

PRINCIPAL IRON-ORE MINES.

During 1910, of the 451 iron-ore mines that operated, 191 mines produced over 50,000 long tons of iron ore each, as compared with 150 mines in 1908. In 1909 permission to publish was not requested by the Bureau of the Census in the collection of the statistics of iron-ore production which were furnished to the Geological Survey. The largest quantity produced by any single mine in 1910 was 3,190,093 long tons, from the Hull-Rust mine at Hibbing, on the Mesabi range, Minnesota. Nine mines in Minnesota, besides one group in Alabama and one mine and one group of mines in Michigan, produced more than 1,000,000 tons each, and the second largest quantity was 1,769,067 long tons, produced by the Red Mountain group of mines, between Bessemer and Birmingham, Ala. Permission has been granted to the Survey by the owners and operators of 158 of these mines to publish their production, and this information is given in the following table:

Iron-ore mines of the United States that produced more than 50,000 long tons each in 1910.

Rank.	Names of mines.	States.	Nearest town.	Variety of ore.	Quantity.
1	Hull-Rust	Minnesota	Hibbing	Hematite	3,190,093
2	Red Mountain Group	Alabama	Bessemer	do	1,769,067
3	Fayal	Minnesota	Eveleth	do	1,523,836
4	Mahoning	do	Hibbing	do	1,515,723
5	Morris	do	do	do	1,364,680
6	Adams	do	Eveleth	do	1,288,325
7	Norrie Group	Michigan	Ironwood	do	1,209,335
8	Newport	do	do	do	1,178,058
9	Shenango	Minnesota	Chisholm	do	1,118,865
10	Canisteo	do	Coleraine	do	1,105,173
11	Burt	do	Hibbing	do	1,032,815
12	Leonard	do	Chisholm	do	1,023,410
13	Stevenson	do	Hibbing	do	976,531
14	Sellers	do	do	do	954,044
15	Virginia Group	do	Virginia	do	939,793
16	Hill	do	Marble	do	801,226
17	Chisholm	do	Chisholm	do	684,122
18	Pioneer	do	Ely	do	671,834
19	Spruce	do	Eveleth	do	658,293
20	Cornwall	Pennsylvania	Miners Village	Magnetite	632,409
21	Leetonia	Minnesota	Hibbing	Hematite	613,789
22	Witherbee, Sherman & Co. (Inc.), Mineville.	New York	Mineville	Magnetite	590,658
23	Chapin	Michigan	Iron Mountain	Hematite	575,720
24	Clark	Minnesota	Chisholm	do	542,294
25	Biwabik	do	Biwabik	do	540,000
26	Woodward	Alabama	Woodward	do	456,959
27	Holman	Minnesota	Taconite	do	414,388
28	Kinney	do	Buhl	do	401,817
29	Vulcan	Michigan	Vulcan	do	400,549
30	Pewabic	do	Iron Mountain	do	380,000
31	Sliver	Minnesota	Virginia	do	354,242
32	Bristol	Michigan	Crystal Falls	do	353,200
33	Uno	Minnesota	Hibbing	do	341,961
34	Commodore	do	Virginia	do	341,548
35	Zenith	do	Ely	do	324,893
36	Lake Superior	Michigan	Ishpeming	do	321,370

Iron-ore mines of the United States that produced more than 50,000 long tons each in 1910—Continued.

Rank.	Names of mines.	States.	Nearest town.	Variety of ore.	Quantity.
37	Glen	Minnesota	Chisholm	Hematite	311,763
38	Lincoln	do	Virginia	do	309,305
39	Hanna, Nos. 1 and 2	do	Mountain Iron	do	305,827
40	Aragon	Michigan	Norway	do	305,020
41	Genoa	Minnesota	Gilbert	do	302,729
42	Virginia	do	Eveleth	do	299,046
43	Grant	do	Buhl	do	297,845
44	Queen Group	Michigan	Negaunee	do	297,284
45	Corsica	Minnesota	McKinley	do	283,210
46	Monroe-Tener	do	Chisholm	do	272,629
47	Albany	do	Hibbing	do	269,929
48	Aurora	Michigan	Ironwood	do	268,906
49	Cary	Wisconsin	Hurley	do	256,807
50	Tobin	Michigan	Crystal Falls	do	254,895
51	Miller	Minnesota	Aurora	do	253,238
52	Susquehanna	do	Hibbing	do	246,563
53	Florence	Wisconsin	Florence	do	245,168
54	Sauntry-Alpena	Minnesota	Virginia	do	245,108
55	Lake Angeline	Michigan	Ishpeming	do	234,484
56	Iroquois	Minnesota	Mountain Iron	do	233,063
57	Utica	do	Hibbing	do	232,734
58	Port Henry, No. 21	New York	Mineville	Magnetite	231,634
59	Caspian	Michigan	Stambaugh	Hematite	223,384
60	Hawkins	Minnesota	Nashwauk	do	222,169
61	Higgins	do	Virginia	do	212,252
62	Colby	Michigan	Bessemer	do	211,711
63	Baltic	do	Stambaugh	do	209,260
64	Bessemer, No. 3 Shaft	Minnesota	Virginia	do	205,968
65	Elba	do	McKinley	do	198,508
66	Brown Mining Co	Tennessee	Cardiff	do	196,438
67	Laura	Minnesota	Hibbing	do	196,309
68	Montreal	Wisconsin	Hurley	do	195,741
69	Cambria	Michigan	Negaunee	do	193,046
70	Mary Charlotte, Nos. 1 and 2	do	do	do	191,838
71	Songo	Alabama	Birmingham	do	189,527
72	Sibley	Minnesota	Ely	do	179,905
73	Ironton	Michigan	Bessemer	do	175,448
74	Republic	do	Republic	do	169,219
75	Mohawk	Minnesota	Aurora	do	168,559
76	Hudson	do	do	do	168,553
77	Hiawatha	Michigan	Iron River	do	168,123
78	Dunn	do	Crystal Falls	do	167,283
79	Crudup	Alabama	Gadsden	do	164,250
80	La Rue	Minnesota	Nashwauk	do	163,967
81	American-Boston	Michigan	Diorite	do	159,250
82	Fowler	Minnesota	Aurora	do	154,127
83	Gilbert	do	Gilbert	do	153,653
84	Adriatic	do	Mesaba	do	152,272
85	Agnew	do	Hibbing	do	151,309
86	Hartford	Michigan	Negaunee	do	147,190
87	Kellogg	Minnesota	Biwabik	do	145,840
88	Greeley	Alabama	Greeley	Brown ore	145,210
89	Riverton Group	Michigan	Iron River	Hematite	140,959
90	Pettit	Minnesota	Gilbert	do	140,798
91	Great Western	Michigan	Crystal Falls	do	136,370
92	Myers	Minnesota	Chisholm	do	134,562
93	Loretto	Michigan	Loretto	do	128,991
94	Woodstock	Alabama	Woodstock	Brown ore	127,647
95	Tilden	Michigan	Bessemer	Hematite	124,043
96	Yale [a]	do	do	do	120,922
97	Mansfield	do	Crystal Falls	do	120,604
98	Raimund, No. 1	Alabama	Bessemer	do	118,675
99	Breitung Hematite, Nos. 1 and 2.	Michigan	Negaunee	do	117,077
100	Brotherton	do	Wakefield	do	116,479
101	Buckeye	Wisconsin	Commonwealth	do	115,063
102	Hartley	Minnesota	Chisholm	do	113,512
103	Richard	New Jersey	Wharton	Magnetite	112,810
104	Hemlock	Michigan	Amasa	Hematite	110,887
105	Sunday Lake	do	Wakefield	do	110,719
106	Croxton	Minnesota	Chisholm	do	110,025
107	Brunt	do	Mountain Iron	do	109,376
108	Cyprus	do	Hibbing	do	108,751
109	Armenia	Michigan	Crystal Falls	do	107,151
110	Rolling Mill	do	Negaunee	do	103,892
111	Ottawa	Wisconsin	Hurley	do	103,442
112	Minorca	Minnesota	Virginia	do	102,039
113	Raimund, No. 2	Alabama	Bessemer	do	100,741
114	Berkshire	Michigan	Stambaugh	do	99,916
115	Soudan	Minnesota	Soudan	do	99,445

[a] July to December.

Iron-ore mines of the United States that produced more than 50,000 long tons each in 1910—Continued.

Rank.	Names of mines.	States.	Nearest town.	Variety of ore.	Quantity.
116	Atlantic	Wisconsin	Iron Belt	Hematite	98,870
117	Onondaga	Minnesota	Virginia	do	98,427
118	Richmond	Michigan	Palmer	do	95,248
119	Oriskany	Virginia	Oriskany	Brown ore	95,158
120	Barron and Franklin	Michigan	Humboldt	Hematite	93,995
121	Troy	Minnesota	Eveleth	do	88,253
122	Monica	do	Biwabik	do	87,021
123	Puritan	Michigan	Ironwood	do	86,444
124	Bartow	Georgia	Cartersville	Brown ore	84,059
125	Madeira	Minnesota	Hibbing	Hematite	82,922
126	Malta	do	Gilbert	do	81,976
127	Steinman	Alabama	Birmingham	do	78,557
128	James	Michigan	Iron River	do	78,387
129	Empire	do	Palmer	do	78,135
130	Mayville	Wisconsin	Mayville	do	77,156
131	Antoine	Michigan	Iron Mountain	do	76,341
132	Houston	Alabama	Woodstock	Brown ore	75,544
133	Hector	Minnesota	Biwabik	Hematite	74,333
134	Winifred	do	Hibbing	do	74,226
135	Mannie	Tennessee	Allens Creek	Brown ore	71,905
136	Gibson	Michigan	Amasa	Hematite	70,158
137	Pearson	Minnesota	Nashwauk	do	69,459
138	Genessee	Michigan	Crystal Falls	do	68,376
139	Champion	Alabama	Oneonta	Brown ore	67,024
140	Riverside, No. 575	Georgia	Cartersville - Emerson	do	66,612
141	Eureka	Michigan	Ramsay	Hematite	66,219
142	Cranberry	North Carolina	Cranberry	Magnetite	65,278
143	Savoy	Minnesota	Ely	Hematite	63,033
144	Pearce	do	Chisholm	do	62,249
145	Knox	do	Mesaba	do	61,686
146	Spaulding	Alabama	Birmingham	do	58,750
147	Mississippi	Minnesota	Hibbing	do	57,967
148	Bray	do	Keewatin	do	57,789
149	Duluth	do	Biwabik	do	57,239
150	Chamberlain	Tennessee	Chamberlain	do	57,023
151	Chatham	Michigan	Iron River	do	56,004
152	Stegmiller	do	Swanzy	do	55,378
153	Valley View	Alabama	Birmingham	do	54,403
154	Euclid	Minnesota	Chisholm	do	53,009
155	Section 30	do	Ely	do	51,250
156	Zimmerman	Michigan	Iron River	do	51,142
157	Tecumseh	Alabama	Tecumseh	Brown ore	50,964
158	Victoria	Minnesota	Virginia	Hematite	50,173
	Total (158 mines)				48,111,574
	Unspecified (33 mines) [a]				5,449,951
	Grand total				53,561,525

[a] Includes the output of 33 mines producing over 50,000 long tons each, operated by 14 companies, which object to the publication of individual statistics.

STOCKS OF IRON ORE AT MINES.

Considerable stock was left at the mines at the end of 1910 which is not included in the production. On December 31, 1910, this stock amounted to 9,408,235 tons, as compared with 6,135,171 tons on December 31, 1909. Besides this stock at the mines, stocks are left at receiving ports and furnaces, but these are included in the annual production.

The following table shows the tonnage of stock left at the mines on December 31, 1909 and 1910, in the various States:

Stock of iron ore on hand at the mines December 31, 1909 and 1910, by States, in long tons.

State.	1909.	1910.	State.	1909.	1910.
Alabama	717,153	716,340	New York	247,286	119,120
California	97	.....	Ohio	9,802	17,430
Colorado	700	.....	Pennsylvania	4,400	11,839
Georgia	46,385	4,090	Tennessee	20,357	14,848
Kentucky	400	.....	Texas	.....	10,600
Maryland	29	1,020	Virginia	1,000	11,348
Massachusetts	711	4,281	Washington	1,000	.....
Michigan	3,186,211	4,698,565	Wisconsin	107,077	286,266
Minnesota	1,678,540	3,486,277			
Missouri	250	8,625	Total	6,135,171	9,406,235
New Jersey	113,773	17,567	Percentage of increase in 1910	.....	53.35

PRICE OF IRON ORE PER TON.

In the following table the price per ton of the different classes of iron ore in 1909 and 1910 is given for each of the producing States or groups of States. The total average prices per long ton in 1910 were: Hematite, $2.52; brown ore, $1.76; magnetite, $2.36; carbonate, $1.61, as compared with prices, respectively, of $2.17, $1.68, $2.40, and $1.73 in 1909. These figures represent the value at the mines and are taken directly from statements of the producers. They should be accepted as only approximately correct. The element of inaccuracy arises from the fact that by far the greater bulk of the iron ore produced in the United States is mined by pig iron producers for their own furnaces, and the value placed on such ore is therefore largely a matter of accounting. Some of the reports made to the Survey evidently include merely actual mining costs; others contain an allowance for sinking fund; and in still others the figures given are merely convenient prices to use in charging costs against the blast furnaces.

It is to be noted, however, that the errors are almost entirely in one direction—that of undervaluing the ore rather than of overvaluing it. If all the iron ore were to be bought by blast furnaces in open market from an entirely distinct set of iron-ore producers, the average prices paid would probably be considerably in excess of those now reported. It is of interest to compare the prices given below with those of the Lake Superior ores at the lower Lake ports given in a subsequent table.

Average price per long ton of iron ore in the United States in 1909 and 1910, by States and varieties.

State.	Hematite.		Brown ore.		Magnetite.		Carbonate.	
	1909.	1910.	1909.	1910.	1909.	1910.	1909.	1910.
Alabama	$1.07	$1.19	$1.41	$1.53	.....	.....	.....	.....
California, Colorado, New Mexico, Washington, and Wyoming	1.00	1.00	1.57	1.94	$1.00	$1.00	.....	.....
Connecticut and Massachusetts	.....	.....	3.69	3.55	.....	.....	.....	.....
Georgia	1.69	1.54	1.50	1.53	.....	.....	.....	.....
Kentucky and West Virginia	1.25	1.25	1.82	1.59	.....	.....	.....	.....
Maryland	.....	.....	1.96	2.07	.....	.....	.....	.....
Michigan	2.71	3.11	.....	.....	.....	.....	.....	.....
Minnesota	2.08	2.45	.....	.....	.....	.....	.....	.....
Missouri	2.49	2.23	1.92	1.96	.....	.....	.....	.....
New Jersey	.....	.....	2.53	3.87	2.96	3.03	.....	.....
New York	1.88	2.21	.....	3.00	3.09	3.03	.....	.....
North Carolina	.....	.....	.....	.....	1.75	1.75	.....	.....
Ohio	.....	.....	.....	.....	.....	.....	$1.73	$1.61
Pennsylvania	2.36	2.34	2.41	2.60	1.01	1.00	.....	.....
Tennessee	1.30	1.25	1.45	1.56	.....	.....	.....	.....
Texas	.....	.....	1.44	1.15	.....	.....	.....	.....
Virginia	1.76	1.74	2.05	2.07	2.00	1.50	.....	.....
Wisconsin	2.56	3.14	1.62	2.50	.....	.....	.....	.....
Total average	2.17	2.52	1.68	1.76	2.40	2.36	1.73	1.61

APPARENT ANNUAL IRON-ORE CONSUMPTION.

The following table includes data on certain factors from which an approximate estimate of the annual consumption of iron ore in the United States is deduced. The result is, of course, merely an approximation, for no data are available on certain other factors which should enter into the final result. The elements considered in the table and estimate are (1) domestic iron-ore production; (2) stocks of ore at mines for current year and past year; (3) stocks of ore at Lake ports for current year and past year; (4) zinc residuum production; (5) imports of ore; (6) exports of ore.

Apparent consumption of iron ore in the United States, 1889–1910, in long tons.

Year.	Domestic iron ore produced.[a]	Stocks of ore at mines.	Stocks of ore at lower Lake ports Dec. 1.	Zinc residuum.	Imports.	Exports.	Apparent consumption.
1889	14,518,041	2,256,973	2,607,106	43,648	853,573	.....	14,366,562
1890	16,036,043	2,000,000	3,893,487	48,560	1,246,830	.....	16,302,025
1891	14,591,178	2,450,279	3,508,489	38,228	912,864	.....	15,476,989
1892	16,296,666	2,911,740	4,149,451	31,859	806,585	.....	16,032,687
1893	11,587,029	3,526,161	4,070,710	37,512	526,951	.....	11,616,412
1894	11,879,079	3,236,198	4,834,247	26,981	167,307	.....	11,600,393
1895	15,957,614	2,976,494	4,415,712	43,249	524,153	.....	17,203,255
1896	16,005,449	3,405,302	4,954,984	44,953	682,806	.....	15,765,128
1897	17,518,046	3,098,287	5,923,755	33,924	489,970	.....	17,380,184
1898	19,433,716	2,846,457	5,136,407	48,502	187,208	.....	20,708,604
1899	24,683,173	2,320,278	5,530,283	65,010	674,082	40,665	25,513,903
1900	27,553,161	3,709,950	5,904,070	87,110	897,831	51,460	26,722,583
1901	28,887,479	4,239,923	5,859,063	52,311	966,950	64,703	29,357,171
1902	35,554,135	3,834,717	7,074,254	65,246	1,165,470	88,445	35,886,921
1903	35,019,308	6,297,888	6,371,085	73,264	980,440	80,611	34,232,399
1904	27,644,330	4,666,031	5,763,399	68,189	487,613	213,865	30,224,910
1905	42,526,133	3,812,281	6,438,067	90,289	845,651	208,017	43,433,138
1906	47,749,728	3,281,789	6,252,455	93,461	1,060,390	265,240	49,355,343
1907	51,720,619	3,033,110	7,385,728	93,413	1,229,168	278,608	51,879,998
1908	38,924,771	6,065,397	8,441,533	110,225	776,898	309,099	32,414,703
1909	51,155,437	6,135,171	8,965,789	141,264	1,694,957	455,934	51,941,694
1910	56,889,734	9,408,235	9,426,881	137,173	2,591,031	644,875	56,161,091

[a] Prior to 1908 iron ore used for fluxing included in production. Such ore excluded 1908–1910. Iron ore sold for paint excluded from 1910 production and included in metallic paint.

COMPARATIVE PRODUCTION OF IRON ORE AND PIG IRON.

Detailed data on the pig-iron production of the United States are presented on later pages of this report, but in the following table an interesting comparison is made between the annual production of iron ore and of pig iron.

Production of iron ore and pig iron in the United States, 1889–1910, in long tons.

Year.	Iron ore mined.[a]	Pig iron produced.[b]	Year.	Iron ore mined.[a]	Pig iron produced.[b]
1889	14,518,041	7,603,642	1900	27,553,161	13,789,242
1890	16,036,043	9,202,703	1901	28,887,479	15,878,354
1891	14,591,178	8,279,870	1902	35,554,135	17,821,307
1892	16,296,666	9,157,000	1903	35,019,308	18,009,252
1893	11,587,629	7,124,502	1904	27,644,230	16,497,033
1894	11,879,679	6,657,388	1905	42,526,133	22,992,380
1895	15,957,614	9,446,308	1906	47,749,728	25,307,191
1896	16,005,449	8,623,127	1907	51,720,619	25,781,361
1897	17,518,046	9,652,680	1908	35,924,771	15,936,018
1898	19,433,716	11,773,934	1909	51,155,437	25,795,471
1899	24,683,173	13,620,703	1910	56,889,734	27,303,567

[a] Prior to 1908, iron ore used for fluxing included in production. Such ore excluded 1908–1910. Iron ore sold for paint excluded from 1910 production and included in metallic paint.
[b] From annual reports of the American Iron and Steel Association.

IRON-ORE INDUSTRY IN THE LAKE SUPERIOR DISTRICT.

Production of iron ore in the Lake Superior district, by ranges.—The Lake Superior district includes the Vermilion, Mesabi, Cuyuna, Penokee-Gogebic, Marquette, and Menominee ranges in the States of Minnesota, Michigan, and Wisconsin. The Menominee range includes the Crystal Falls, Metropolitan, Iron River, and Florence areas; the Marquette range includes the Republic and Swanzy areas. The Baraboo and Iron Ridge areas of southern Wisconsin and the Spring Valley area of northwestern Wisconsin are frequently also included in the Lake Superior district. In the first group of ranges the ore mined is almost entirely Algonkian hematite, belonging to the Huronian series. The Baraboo ore is of the same nature, but the Iron Ridge ore is Clinton hematite, and the Spring Valley ore is brown ore.

In addition to these ranges, there are several iron-ore districts on the Canadian side of the Great Lakes, the principal ones of which are the Michipicoten, the Animikie, the Matawin, and the Atikokan.

The American ranges which produced ore in 1910 were the Vermilion, Mesabi, Penokee-Gogebic, Marquette, and Menominee, besides the Baraboo, Iron Ridge, and Spring Valley areas. Much development work was done on the Cuyuna range, which is expected to show a production in 1911. The following table shows the production of the first five of these for 1909 and 1910, as they constitute the Lake Superior district proper.

The Mesabi range produced 66 per cent of the entire Lake Superior output and about 53.75 per cent of the entire production of the United States. The Menominee, Penokee-Gogebic, and Marquette ranges are next in importance, the Menominee producing a little more and the others a little less than the State of Alabama, which is the next State in importance as a producer after Minnesota and Michigan. The Vermilion range, the last in importance of the five producing Lake Superior ranges, produced more ore in 1910 than New York, which is fourth in importance as a producing State.

In the following tables is shown the total production of the Lake Superior district by ranges. The figures prior to 1872 were collected by A. P. Swineford, editor Marquette Mining Journal;[1] those for 1872 to 1877, inclusive, are from the Michigan Mineral Statistics; those from 1878 to 1888, inclusive, were collected by W. J. Stevens;[2] and the later figures were collected by the United States Geological Survey.

Production of iron ore in the Lake Superior region, 1909–1910, by ranges.

Range.	1909.	1910.	Increase in 1910.	Percentage of increase in 1910.	Percentage of total production in Lake Superior region.
	Long tons.	*Long tons*	*Long tons.*		
Marquette (Michigan)	[a] 4,291,967	4,631,427	339,460	7.91	10.00
Menominee (Michigan and Wisconsin)	4,789,362	4,983,729	194,367	4.06	10.76
Gogebic (Michigan and Wisconsin)	[a] 3,807,157	4,746,818	939,661	24.68	10.24
Vermilion (Minnesota)	1,097,444	1,390,360	292,916	26.69	3.00
Mesabi (Minnesota)	27,877,705	30,576,409	2,698,704	9.68	66.00
Total	41,863,635	46,328,743	4,465,108	10.67	100.00

[a] Some Gogebic ore included in Marquette.

Production of Lake Superior iron ore, 1854–1910, by ranges, in long tons.

Year.	Marquette.	Menominee.	Gogebic.	Vermilion.	Mesabi.	Total.
1854–1869	3,112,209					3,112,209
1870	859,507					859,507
1871	813,984					813,984
1872	948,553					948,553
1873	1,195,234					1,195,234
1874	899,934					899,934
1875	881,166					881,166
1876	993,311					993,311
1877	1,014,754	10,375				1,025,129
1878	1,033,082	78,028				1,111,110
1879	1,130,019	245,672				1,375,691
1880	1,384,010	524,735				1,908,745
1881	1,579,834	726,671				2,306,505
1882	1,829,394	1,136,018				2,965,412
1883	1,305,364	1,047,863				2,353,227
1884	1,559,912	895,634	1,022	62,122		2,518,690
1885	1,430,862	690,435	119,590	227,075		2,467,962
1886	1,627,383	880,006	756,237	307,948		3,571,574
1887	1,851,717	1,199,343	1,285,265	394,910		4,731,235
1888	1,918,672	1,191,097	1,433,689	511,953		5,055,411
1889	2,631,026	1,876,157	2,147,923	864,508		7,519,614
1890	2,863,548	2,274,192	2,914,081	891,910		8,944,031
1891	2,778,482	1,856,124	2,041,754	945,105		7,621,465
1892	2,848,552	2,402,195	3,058,176	1,226,220	29,245	9,564,388
1893	2,064,527	1,563,049	1,466,815	815,735	684,194	6,594,620
1894	1,935,379	1,255,255	1,523,451	1,055,229	1,913,234	7,682,548
1895	1,982,080	1,794,970	2,625,475	1,027,103	2,839,350	10,268,978
1896	2,418,846	1,763,235	2,100,398	1,200,907	3,082,973	10,566,359
1897	2,673,785	1,767,220	2,163,088	1,381,278	4,220,151	12,205,522
1898	2,987,930	2,275,064	2,552,205	1,125,538	4,837,971	13,779,308
1899	3,634,596	3,281,422	2,725,648	1,643,984	6,517,305	17,802,955
1900	3,945,068	3,680,738	3,104,033	1,675,949	8,158,450	20,564,238
1901	3,597,089	3,697,408	3,041,869	1,805,996	9,303,541	21,445,903
1902	3,734,712	4,421,250	3,683,792	2,057,532	13,080,118	26,977,404
1903	3,686,214	4,093,320	3,422,341	1,918,584	13,452,812	26,573,271
1904	2,465,448	2,871,130	2,132,898	1,056,430	11,672,405	20,198,311
1905	3,772,045	4,472,630	3,344,551	1,578,626	20,156,566	33,325,018
1906	4,070,914	4,962,357	3,484,023	1,794,186	23,564,891	37,876,371
1907	4,167,810	4,779,592	3,609,519	1,724,217	27,245,441	41,526,579
1908	3,309,017	2,904,011	3,241,931	927,206	17,725,014	28,108,079
1909	4,291,967	4,789,362	3,807,157	1,097,444	27,877,705	41,863,635
1910	4,631,427	4,983,729	4,746,818	1,390,360	30,576,409	46,328,743
Total	97,861,463	76,390,887	66,533,749	30,708,055	226,937,775	498,431,929

[1] Mineral Resources U. S. for 1882, p. 116.

[2] Mineral Resources U. S. for 1891, p. 41.

Shipments and receipts of Lake Superior ore.—During 1910, 43,442,397 long tons of iron ore were shipped from the Lake Superior district. Of this total 813,639 tons were shipped by rail, the remainder being Lake shipments. Details concerning the shipments and receipts of these ores are given in the following tables, which are taken from the Iron Trade Review:

Shipments of Lake Superior iron ore, 1905–1910, in long tons.[a]

Shipping port.	1905.	1906.	1907.	1908.	1909.	1910.
Two Harbors	7,779,850	8,180,125	8,188,906	5,702,237	9,181,132	8,271,177
Escanaba	5,307,938	5,851,050	5,761,988	3,351,502	5,747,801	4,959,726
Duluth	8,807,569	11,220,218	13,448,736	8,808,168	13,470,503	13,640,166
Ashland	3,485,344	3,388,106	3,436,867	2,513,670	3,834,207	4,094,374
Marquette	2,977,828	2,791,033	3,013,826	1,487,487	2,909,451	3,248,516
Superior	5,118,385	6,083,057	7,440,386	3,564,030	6,540,505	8,414,799
Total	33,476,904	37,513,589	41,290,709	25,427,094	41,683,599	42,628,758
All-rail shipments	907,212	1,052,173	975,959	587,893	903,270	813,639
Grand total	34,384,116	38,565,762	42,266,668	26,014,987	42,586,869	43,442,397

[a] Iron Trade Review.

Iron-ore receipts at Lake Erie ports, 1905–1910, in long tons.[a]

Port.	1905.	1906.	1907.	1908.	1909.	1910.
Ashtabula, Ohio	6,373,779	6,833,352	7,521,859	3,012,064	8,056,941	9,620,638
Cleveland, Ohio	5,854,745	6,604,061	6,495,998	4,240,816	6,051,342	6,344,943
Conneaut, Ohio	5,327,552	5,432,370	5,875,937	4,798,631	7,007,834	6,309,548
Buffalo and Tonawanda, N. Y.	3,774,928	4,928,331	5,580,438	2,835,099	5,002,235	4,704,439
Erie, Pa	2,112,476	1,986,539	2,294,239	828,602	1,235,057	942,592
Fairport, Ohio	2,008,621	1,861,498	2,437,649	1,518,961	1,734,277	1,516,434
Toledo, Ohio	1,006,855	1,423,741	1,314,140	680,553	1,374,224	1,225,202
Lorain, Ohio	1,605,823	2,191,965	2,621,025	2,286,388	2,796,856	2,884,738
Huron, Ohio	825,278	778,453	971,430	213,377	243,062	197,951
Sandusky, Ohio	51,202	35,847	83,043	.....	11,088	.....
Total	28,941,259	32,076,757	35,195,758	20,414,491	33,512,936	33,746,485

[a] Iron Trade Review.

The following table shows the total quantity of iron ore shipped from the Lake Superior district since 1854, the date of the opening of the Marquette range, the oldest of the Lake Superior ranges. This table gives the shipments as collected by the Iron Trade Review and is inserted for comparison with the table giving the total production of the Lake Superior district, without regard to shipments:

Shipments of iron ore from the Lake Superior region, 1854–1910, in long tons.

Year.	Quantity.	Year.	Quantity.	Year.	Quantity.
1854	3,000	1874	919,557	1894	7,748,932
1855	1,449	1875	891,257	1895	10,429,037
1856	36,343	1876	992,764	1896	9,934,828
1857	25,646	1877	1,015,087	1897	12,469,638
1858	15,876	1878	1,111,110	1898	14,024,673
1859	68,832	1879	1,375,691	1899	18,251,804
1860	114,401	1880	1,908,745	1900	19,059,393
1861	49,909	1881	2,306,505	1901	20,589,237
1862	124,169	1882	2,965,412	1902	27,571,121
1863	203,055	1883	2,353,288	1903	24,289,878
1864	243,127	1884	2,518,692	1904	21,822,839
1865	236,208	1885	2,466,372	1905	34,384,116
1866	278,796	1886	3,568,022	1906	38,565,762
1867	473,567	1887	4,730,577	1907	42,266,668
1868	491,449	1888	5,063,693	1908	26,014,987
1869	617,444	1889	7,292,754	1909	42,586,869
1870	830,940	1890	9,012,379	1910	43,442,397
1871	779,607	1891	7,062,233		
1872	900,901	1892	9,069,556	Total	492,793,542
1873	1,162,458	1893	6,060,492		

Stocks of iron ore at Lake Erie ports.—At the close of navigation in 1910 the stocks of iron ore at the Lake Erie ports exceeded those of the same date in 1909 by 461,092 tons; and the stocks of 1909 exceeded those of 1908 by 524,256 tons.

The following statistics from the Iron Trade Review contain data as to the stocks of iron ore at the Lake Erie ports at the close of navigation and at the opening of navigation for the last six years:

Stocks of iron ore at lower Lake ports, December 1, 1905–1910, in long tons.[a]

Port.	At close of navigation, December 1—					
	1905.	1906.	1907.	1908.	1909.	1910.
Ashtabula, Ohio	1,589,951	1,631,312	2,056,820	2,293,531	2,504,359	3,287,816
Cleveland, Ohio	1,330,619	1,224,606	1,281,335	1,458,392	1,547,142	1,638,795
Fairport, Ohio	759,961	590,783	523,981	835,821	867,640	839,970
Erie, Pa	564,961	552,631	652,219	730,530	788,046	792,011
Lorain, Ohio	271,695	336,321	366,271	426,274	407,129	259,448
Conneaut, Ohio	976,976	1,057,424	1,090,774	1,296,675	1,411,002	1,329,997
Toledo, Ohio	368,024	281,000	518,645	590,925	332,456	433,215
Huron, Ohio	208,023	245,499	415,730	458,158	477,333	375,118
Buffalo, N. Y	315,780	315,412	435,407	315,148	501,125	452,783
Sandusky, Ohio	52,977	17,467	44,546	36,079	39,557	17,728
Total	6,438,967	6,252,455	7,385,728	8,441,533	8,965,789	9,426,881

[a] Iron Trade Review, May 13, 1909, May 12, 1910, and May 18, 1911.

Stocks of iron ore at lower Lake ports, May 1, 1906–1911, in long tons.[a]

Port.	At opening of navigation, May 1—					
	1906.	1907.	1908.	1909.	1910.	1911.
Ashtabula, Ohio	462,564	568,485	1,799,454	1,392,430	1,609,931	2,277,931
Cleveland, Ohio	350,382	447,573	1,029,198	1,018,055	985,725	1,502,858
Fairport, Ohio	266,162	154,246	225,328	562,679	541,299	633,485
Erie, Pa	169,488	189,276	595,660	557,029	550,187	653,778
Lorain, Ohio	140,452	176,300	327,052	362,096	205,445	346,849
Conneaut, Ohio	148,528	139,853	462,392	497,203	461,365	419,421
Toledo, Ohio	52,550	147,397	217,788	380,675	366,631	383,761
Huron, Ohio	80,738	98,106	392,731	379,364	336,693	273,042
Buffalo, N. Y	90,906	50,313	388,441	189,209	364,336	347,702
Sandusky, Ohio	29,320	5,439	42,256	31,528	22,468	11,458
Total	1,791,090	1,976,988	5,480,300	5,370,268	5,444,080	6,850,285

[a] Iron Trade Review, May 13, 1909, May 12, 1910, and May 18, 1911.

Prices of Lake Superior iron ore.—In the following table are given the prices of Lake Superior iron ore at the lower Lake ports during 1909 and 1910.

The base for the Bessemer ore is a metallic iron content of 55 per cent; that of the non-Bessemer ore is a metallic iron content of 51.5 per cent.

Base prices per long ton of Lake Superior iron ore at lower Lake ports, 1909–1910.

	1909.	1910.[a]		1909.	1910.[a]
Old range:			Mesabi:		
Bessemer	$4.50	$5.00	Bessemer	$4.25	$4.75
Non-Bessemer	3.70	4.20	Non-Bessemer	3.50	4.00

[a] Iron Trade Review, Jan. 13, 1910.

FOREIGN TRADE IN IRON ORE.

IMPORTS.

The quantity of iron ore imported into the United States in 1910 exceeded the imports of any year heretofore recorded. The imports of 1910 exceeded those of 1909 by 53 per cent. About 56 per cent of the imports were from Cuba, about 17 per cent from Spain, about 10 per cent from Sweden, and the bulk of the rest was from Newfoundland, the imports from which decreased 7 per cent from those of 1909. The statistics with regard to imports are furnished by the Bureau of Statistics of the Department of Commerce and Labor.

In the following table are shown the imports of iron ore from the various countries from 1907 to 1910, inclusive:

Quantity and value of iron ore imported into the United States in the calendar years 1907–1910, by countries, in long tons.

Country.	1907.		1908.		1909.		1910.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Cuba	657,133	$2,522,710	579,668	$1,756,091	927,774	$2,681,028	1,451,096	$4,459,789
Spain	296,318	760,801	126,074	331,070	291,547	664,460	439,868	1,040,589
French Africa	65,940	252,897	.....	.....	37,208	67,515	15,471	36,791
Greece	23,800	42,927	4,850	5,311	19,080	21,782	39,060	71,951
Newfoundland and Labrador	89,685	97,735	48,285	48,285	224,395	330,056	209,006	343,892
United Kingdom	5,765	16,491	2,028	32,027	869	12,846	11,388	52,591
Germany	273	2,096	602	4,052	3	100	3	58
Netherlands	500	3,673	.....	.....	.....	.....	.....	.....
Canada	26,878	51,328	5,013	16,321	27,155	84,613	95,005	251,086
Belgium	125	1,102	1	28	3	179	158	644
Russia in Europe	.....	.....	.....	.....	32,010	62,418	12,570	48,279
Sweden	.....	.....	4,617	15,783	120,564	627,315	259,911	1,391,976
Other countries	62,751	185,723	5,760	15,280	[a] 14,349	28,766	[b] 57,495	134,579
Total	1,229,168	3,937,483	776,898	2,224,248	1,694,957	4,579,078	2,591,031	7,832,225

[a] Other countries in 1909: Colombia and Mexico.
[b] Other countries in 1910: Chinese Empire, Colombia, Egypt, British South Africa, etc.

The following table shows the imports of iron ore into the United States from 1907 to 1910, inclusive, by ports of entry:

Quantity and value of iron ore imported into the United States in the calendar years 1907–1910, by customs districts, in long tons.

Customs district.	1907.		1908.		1909.		1910.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Baltimore	639,602	$2,436,457	248,875	$844,436	628,577	$1,838,762	1,137,916	$3,575,059
Boston	479	2,071	21	61	7	29	235	853
Charleston	500	3,673	500	3,070	.....	.....	.....	.....
New York	7,405	19,989	4,392	17,424	47,285	93,277	78,556	213,282
Perth Amboy	.....	.....	1,355	23,637	.....	.....	.....	.....
Philadelphia	554,104	1,422,503	516,619	1,318,182	991,983	2,559,760	1,269,180	3,775,770
Savannah	100	630	.....	.....	.....	.....	.....	.....
Chicago	.....	.....	.....	.....	.....	.....	7,679	22,610
Los Angeles	.....	.....	51	501	.....	.....	.....	.....
Puget Sound	1,976	6,365	.....	.....	.....	.....	25,000	47,750
San Francisco	100	832	50	446	.....	.....	.....	.....
Buffalo Creek	172	96	.....	.....	141	489	4,200	4,473
Champlain	5	20	10	30	40	75	29	73
Cuyahoga	18,866	33,393	1,712	3,030	3,500	15,250	.....	.....
Detroit	.....	.....	.....	.....	25	777	306	765
Erie	5,400	9,558	.....	.....	4,000	16,700	.....	.....
Miami	.....	.....	2,569	9,403	18,106	46,106	63,966	172,824
Niagara	292	652	23	40	596	2,310	2,343	11,166
Oswegatchie	.....	.....	23	60	.....	.....	25	75
Vermont	167	1,244	676	3,758	455	2,064	137	1,509
St. Louis	.....	.....	22	170	.....	.....	.....	.....
Genesee	.....	.....	.....	.....	17	895	10	553
Other districts	.....	.....	.....	.....	225	2,594	1,449	5,463
Total	1,229,168	3,937,483	776,898	2,224,248	1,694,957	4,579,078	2,591,031	7,832,225

In the following table is shown the importation of iron ore into the United States as far as has been recorded. Iron ore was imported from Europe in large quantities for the first time in 1879, most of the ore prior to that date coming from Canada.

Imports of iron ore into the United States, 1872–1910, in long tons.

Year.	Quantity.	Year.	Quantity.	Year.	Quantity.
1872	23,733	1885	390,786	1899	674,082
1873	45,981	1886	1,039,433	1900	897,831
1874	57,987	1887	1,194,301	1901	966,950
1875	56,655	1888	587,470	1902	1,165,470
1876	17,284	1889	853,573	1903	980,440
1877	30,669	1890	1,246,830	1904	487,613
1878	28,212	1891	912,864	1905	845,651
1879 [a]	150,197	1892	806,585	1906	1,060,390
1879 [b]	284,141	1893	526,951	1907	1,229,168
1880	493,408	1894	167,307	1908	776,898
1881	782,887	1895	524,153	1909	1,604,957
1882	589,655	1896	682,806	1910	2,591,031
1883	490,875	1897	489,970		
1884	487,820	1898	187,208		

[a] Fiscal years end. [b] Calendar years begin.

EXPORTS.

The quantity of iron ore exported from the United States in 1910 amounted to 644,875 long tons, an increase of more than 41 per cent over iron-ore exports in 1909.

In the following table is shown the exportation of iron ore from the United States, by customs districts, from 1907 to 1910, inclusive. The data regarding exports are collected by the Bureau of Statistics, Department of Commerce and Labor.

Quantity and value of iron ore exported from the United States in the calendar years, 1907–1910, by customs districts, in long tons.

Customs district.	1907.		1908.		1909.		1910.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Newport News	77	$419						
Savannah							10	75
Norfolk and Portsmouth	18	240			3	$27		
Arizona	206	1,098						
Buffalo Creek			25	$140	336	1,506	1,203	6,054
Champlain	14,855	44,595	7,359	22,517	9,417	27,170	19,941	71,740
Detroit	4	47	4	46				
Duluth	43,513	150,722	52,509	187,059	129,231	471,088	187,042	650,654
Niagara	60	195	3,097	7,289	6,887	21,819	2,848	12,956
Superior	219,761	565,644	244,408	789,306	306,270	830,415	415,396	1,283,824
Vermont	114	462	1,697	6,567				
Puget Sound					3,790	13,300	18,435	48,861
Total	278,608	763,422	309,099	1,012,924	455,934	1,365,325	644,875	2,074,164

The quantity of iron ore exported from the United States, as far as has been recorded, is shown in the following table:

Exports of iron ore from the United States, 1899–1910, in long tons.

Year.	Quantity.	Year.	Quantity.
1899	40,665	1905	208,017
1900	51,460	1906	265,240
1901	64,703	1907	278,608
1902	88,445	1908	309,099
1903	80,611	1909	455,934
1904	213,865	1910	644,875

IRON-ORE INDUSTRY OF CUBA.

The iron ores which have been mined in Cuba up to the present time consist largely of hematite and magnetite and are obtained near Santiago, in the Province of Oriente (Santiago). Recently large deposits of brown ore have been attracting considerable attention, especially those of the Mayari and the Moa fields, in Oriente Province, and those of the Cubitas field, in Camaguey Province. No ores of this type were reported as mined in 1909, but there was a considerable production in 1910. Several interesting papers have been published by the American Institute of Mining Engineers on Cuban iron ores within the last year, and these are listed in the bibliography at the end of this chapter.

The following table shows the shipments of iron ore from Cuba since the opening of the mines in 1884. The statistics of the Cuban iron-ore production were collected by the United States Geological Survey.

Shipments of iron ore from mines in the Province of Oriente (Santiago), 1884–1910, in long tons.

Year.	Juragua Iron Co. (Limited).	Sigua Iron Co.	Spanish-American Iron Co.	Cuban Steel Ore Co.	Ponupo Manganese Co.	Total.
1884	25,295					25,295
1885	80,716					80,716
1886	112,074					112,074
1887	94,240					94,240
1888	206,061					206,061
1889	260,291					260,291
1890	363,842					363,842
1891	264,262					264,262
1892	335,236	6,418				341,654
1893	337,155	14,020				351,175
1894	156,826					156,826
1895	307,503		74,991			382,494
1896	298,885		114,110			412,995
1897	[a] 248,256		[b] 206,029			454,285
1898	83,996		84,643			168,339
1899	161,783		215,406			377,189
1900	154,871		292,001			446,872
1901	199,764		[c] 334,833	17,651		552,248
1902	221,039		455,105	23,590		699,734
1903	155,898		467,723			623,621
1904	31,162		356,111			387,273
1905	139,828		421,331			561,159
1906	133,379		507,195			640,574
1907	181,063		500,330			681,393
1908	366,580		452,854			819,434
1909	356,659		514,066		59,721	930,446
1910	318,814		934,092		165,008	1,417,914

[a] Of this quantity, 5,932 tons were sent to Pictou, Nova Scotia.
[b] Of this quantity, 51,537 tons were sent to foreign ports.
[c] Of this quantity, 12,691 tons were sent to foreign ports.

WORLD'S PRODUCTION OF IRON ORE.

The latest available statistics with regard to the world's production of iron ore are shown in the following table. Of the figures in this table, those for the United States, Great Britain, Cuba, Canada, India, and Australia are in long tons; those for the other countries are in metric tons.

World's production of iron ore in 1908 and 1909, by countries.

Country.	1908.	1909.
	Tons.	*Tons.*
United States	35,924,771	51,155,437
Germany and Luxemburg	24,278,151	25,506,000
United Kingdom	15,031,025	14,979,979
Spain	9,271,592	(a)
France	10,057,145	11,890,000
Russia	(a)	(a)
Sweden	4,713,160	(a)
Austria-Hungary	4,718,700	(b)
Canada	c 212,573	c 239,324
Newfoundland	935,154	c 991,115
Cuba	930,446	1,417,914
Algeria	943,424	891,000
Tunis	148,000	218,000
Greece	515,368	(a)
Italy	539,120	531,000
Belgium	188,780	200,000
China d	133,458	(a)
India	72,300	83,456
Japan	(a)	(a)
Norway	119,656	(a)
Australia	55,194	(a)

a Not available.
b Austria produced 2,490,000 tons. Figures for Hungary not available.
c Shipments.
d Exports.

IRON AND STEEL INDUSTRY OF THE UNITED STATES.

PRODUCTION AND VALUE OF PIG IRON BY STATES.

The production of pig iron in 1910 amounted to 27,303,567 long tons, valued f. o. b. at the furnaces at $425,115,235, as compared with 25,795,471 long tons, valued at $419,175,000, in 1909, an increase in quantity of 1,508,096 tons and in value of $5,940,235. The average value per ton in 1910 was $15.57 and in 1909 it was $16.25, a decrease in 1910 of 68 cents per ton. The figures of output of pig iron and steel given herewith are the official statistics of the American Iron and Steel Association, published by James M. Swank, general manager of the association, in his annual statistical reports. The values of pig iron for 1907, 1908, and 1910 were reported to the United States Geological Survey by the manufacturers, and represent the approximate value f. o. b. at the furnaces, therefore eliminating freight costs, commissions, etc., which are included in the market prices of pig iron as published in the trade journals. The value for 1909 is an estimate made on a basis similar to that used in estimating the values prior to 1907. The production of pig iron includes the pig iron, ferromanganese, spiegeleisen, etc., produced from foreign as well as domestic ore, since there are no data at present available for separating out the production derived from domestic ore. The quantity and value of blast furnace products derived from ore imported from Cuba, Spain, Newfoundland and Labrador, and Sweden is considerable,

but, of course, it constitutes a very small percentage of the total production.

The following table shows the quantity and approximate value of pig iron production in the United States in 1909 and 1910, and the increase or decrease, both by totals and percentages, for the various producing States:

Quantity and value of pig iron produced in the United States in 1909 and 1910, by States, in long tons.

State.	1909.		1910.		Increase (+) or decrease (−) in 1910.		Percentage of increase (+) or decrease (−) in 1910.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Alabama	1,763,617	$22,222,000	1,939,147	$23,754,551	+ 175,530	+$1,532,551	+ 9.95	+ $6.90
Illinois	2,467,156	44,211,000	2,675,646	42,917,362	+ 208,490	− 1,293,638	+ 8.45	− 2.93
Kentucky	86,371	1,398,000	100,509	1,692,572	+ 14,138	+ 294,572	+ 16.37	+ 21.07
Maryland	286,856	4,673,000	326,214	5,230,824	+ 39,358	+ 557,824	+ 13.72	+ 11.94
New Jersey	294,474	4,473,000	264,781	4,204,722	− 29,693	− 268,278	− 10.08	− 6.00
New York	1,733,675	27,392,000	1,938,407	32,410,165	+ 204,732	+ 5,018,165	+ 11.81	+ 18.32
Ohio	5,551,545	93,321,000	5,752,112	88,122,356	+ 200,567	− 5,198,644	+ 3.61	− 5.57
Pennsylvania	10,918,824	175,429,000	11,272,323	180,695,338	+ 353,499	+ 5,266,338	+ 3.24	+ 3.00
Tennessee	333,845	4,647,000	397,569	5,271,765	+ 63,724	+ 624,765	+ 19.09	+ 13.44
Virginia	391,134	5,683,000	444,976	6,207,415	+ 53,842	+ 524,415	+ 13.77	+ 9.23
West Virginia	228,282	3,835,000	174,661	2,619,915	− 53,621	− 1,215,085	− 23.49	− 31.68
California, Colorado, Missouri, Oregon, Washington	382,766	7,370,000	428,612	6,514,902	+ 45,846	− 855,098	+ 11.98	− 11.60
Connecticut, Massachusetts	18,388	650,000	16,582	516,363	− 1,806	− 133,637	− 9.82	− 20.56
Georgia, Texas	26,072	442,000	14,725	323,950	− 11,347	− 118,050	− 43.52	− 26.71
Indiana, Michigan	964,289	17,570,000	1,250,103	19,751,627	+ 285,814	+ 2,181,627	+ 29.64	+ 12.42
Minnesota, Wisconsin	348,177	5,859,000	307,200	4,881,408	− 40,977	− 977,592	− 11.77	− 16.68
Total	25,795,471	419,175,000	27,303,567	425,115,235	+1,508,096	+ 5,940,235	+ 5.85	+ 1.42

The following table gives the annual average price per long ton of pig iron in the United States for the years 1889 to 1910, inclusive. The prices prior to 1907 include the cost of transportation from blast furnaces to markets. The extreme range in prices, from $9.76 in 1894 to $20.92 in 1902, is of interest in view of present manufacturing conditions:

Average price per long ton of pig iron in the United States, 1889–1910.

1889	$15.78	1897	$9.85	1904	$14.13
1890	16.43	1898	9.90	1905	16.63
1891	15.50	1899	18.00	1906	19.98
1892	14.32	1900	18.85	1907	20.56
1893	11.90	1901	15.25	1908	15.96
1894	9.76	1902	20.92	1909	16.25
1895	11.14	1903	19.12	1910	15.57
1896	10.47				

The following table shows the number of blast furnaces in blast on June 30 and December 31, and the total number of stacks recorded, for the years 1909 and 1910:

Record of blast furnaces in the United States, 1909 and 1910, by States.

State.	Furnaces in blast June 30, 1909.	Dec. 31, 1909.			Furnaces in blast June 30, 1910.	Dec. 31, 1910.		
		In.	Out.	Total.		In.	Out.	Total.
Pennsylvania	103	134	28	162	116	74	90	164
Ohio	44	61	13	74	50	35	41	76
Illinois	19	23	3	26	20	11	15	26
Alabama	19	29	22	51	24	20	30	50
New York	15	17	11	28	18	15	14	29
Virginia	9	13	13	26	11	9	17	26
Tennessee	9	13	8	21	12	10	10	20
Colorado	3	3	3	6	4	2	4	6
Missouri	2	2	0	2	2	1	1	2
Oregon	0	0	1	1	0	0	1	1
Washington	0	0	1	1	0	0	1	1
California	0	0	0	0	0	0	0	0
Maryland	3	4	1	5	4	2	3	5
New Jersey	3	5	6	11	3	2	7	9
Wisconsin	5	6	1	7	4	4	3	7
Minnesota	1	1	0	1	1	1	0	1
Indiana	5	7	0	7	6	3	6	9
Michigan	7	11	4	15	11	9	7	16
West Virginia	3	3	1	4	1	1	3	4
Kentucky	3	2	6	8	3	2	6	8
Georgia	1	0	4	4	0	1	3	4
Texas	0	0	4	4	0	0	4	4
Connecticut	3	2	1	3	2	3	0	3
Massachusetts	1	2	0	2	1	1	1	2
Total	258	338	131	469	293	206	267	473

The accompanying diagram (fig. 2) illustrates the course of the manufacture of pig iron, by months, in 1907, 1908, 1909, and 1910. The sudden decline in production of pig iron at the close of October, 1907, the low production during the first half of 1908, the slow recovery of activity in the last half of 1908, the hesitating conditions early in 1909, the steady and rapid increase in production during the last part of that year, culminating in December with a record production of more than 2,682,000 tons, and finally the gradual, almost uninterrupted decline throughout the year 1910, are all strikingly displayed.

PRODUCTION OF PIG IRON BY GRADES.

The following table shows the production of the principal grades of pig iron from 1906 to 1910, inclusive:

Production of pig iron in the United States, 1906–1910, by grades, in long tons.

Grade.	1906.	1907.	1908.	1909.	1910.
Bessemer and low phosphorus	13,840,518	13,231,620	7,216,976	10,557,370	11,245,642
Basic (mineral fuel)	5,018,674	5,375,219	4,010,144	8,250,225	9,084,608
Forge pig iron	597,420	683,167	457,164	725,624	564,157
Foundry and ferrosilicon	4,773,011	5,151,209	3,637,622	5,322,415	5,260,447
Malleable Bessemer	699,701	920,290	414,957	658,048	843,123
Spiegeleisen	244,980	283,430	111,376	142,831	153,055
Ferromanganese	55,520	55,918	40,642	82,209	71,376
White, mottled, direct castings, etc	77,367	80,508	47,137	56,749	81,159
Total	25,307,191	25,781,361	15,936,018	25,795,471	27,303,567

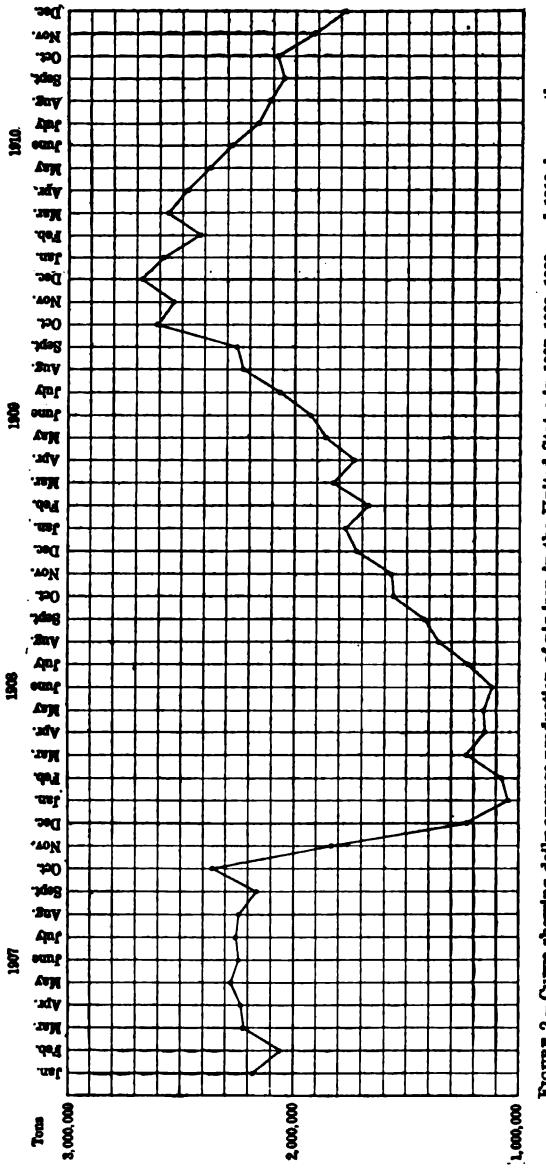

FIGURE 2.—Curve showing daily average production of pig iron in the United States in 1907, 1908, 1909, and 1910, by months.

[Tonnage by months according to the Iron Trade Review.

PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

In the following table is given the production of pig iron according to the fuel used, from 1906 to 1910, inclusive:

Production of pig iron according to fuel used, 1906–1910, in long tons.

Fuel used.	1906.	1907.	1908.	1909.	1910.
Bituminous, chiefly coke	23,313,498	23,972,410	15,331,863	24,721,037	26,257,978
Anthracite and coke	1,535,614	1,335,286	353,315	682,383	628,579
Anthracite alone	25,072	36,268	1,694	16,048	20,503
Charcoal	433,007	437,397	249,146	376,003	396,507
Total	25,307,191	25,781,361	15,936,018	25,795,471	27,303,567

TOTAL PRODUCTION OF PIG IRON.

The following table shows the production of pig iron in the United States as far as has been recorded. The statistics for 1854 and all succeeding years were collected by the American Iron and Steel Association; those for 1810, 1840, and 1850 are census figures; those for the other years are largely estimates by early statisticans.

Production of pig iron in the United States, 1810–1910, in long tons.

Year.	Quantity.	Year.	Quantity.	Year.	Quantity.
1810	53,908	1863	846,075	1887	6,417,148
1820	20,000	1864	1,014,282	1888	6,489,738
1828	130,000	1865	831,770	1889	7,603,642
1829	142,000	1866	1,205,663	1890	9,202,703
1830	165,000	1867	1,305,023	1891	8,279,870
1831	191,000	1868	1,431,250	1892	9,157,000
1832	200,000	1869	1,711,287	1893	7,124,502
1840	286,903	1870	1,665,179	1894	6,657,388
1842	215,000	1871	1,706,793	1895	9,446,308
1846	765,000	1872	2,548,713	1896	8,623,127
1847	800,000	1873	2,560,963	1897	9,652,680
1848	800,000	1874	2,401,262	1898	11,773,934
1849	650,000	1875	2,023,733	1899	13,620,703
1850	563,755	1876	1,868,961	1900	13,789,242
1852	500,000	1877	2,066,594	1901	15,878,354
1854	667,337	1878	2,301,215	1902	17,821,307
1855	700,159	1879	2,741,853	1903	18,009,252
1856	788,515	1880	3,835,191	1904	16,497,033
1857	712,640	1881	4,144,254	1905	22,992,380
1858	629,548	1882	4,623,323	1906	25,307,191
1859	750,560	1883	4,595,510	1907	25,781,361
1860	821,223	1884	4,097,868	1908	15,936,018
1861	653,164	1885	4,044,526	1909	25,795,471
1862	703,270	1886	5,683,329	1910	27,303,567

PRICES OF PIG IRON.

In the following table are given the average monthly prices of the principal kinds of pig iron for 1909 and 1910:

Average monthly prices per ton of pig iron, 1909 and 1910, by months and kinds.

Month.	1909.			1910.		
	Gray forge pig iron at Pittsburgh.	Bessemer pig iron at Pittsburgh.	Basic pig iron at Philadelphia.	Gray forge pig iron at Pittsburgh.	Bessemer pig iron at Pittsburgh.	Basic pig iron at Philadelphia.
January	$15.40	$17.34	$16.75	$17.40	$19.90	$18.75
February	15.09	16.77	16.56	17.02	19.34	18.56
March	14.65	16.34	15.60	16.15	18.60	18.25
April	14.40	15.80	15.00	16.09	18.34	17.56
May	14.40	15.84	15.13	15.90	17.52	16.69
June	14.77	16.02	15.50	15.20	16.62	16.10
July	14.85	16.40	15.88	14.52	16.40	15.68
August	15.21	17.02	17.06	14.30	16.09	15.12
September	16.15	18.05	18.13	14.15	15.90	15.00
October	17.02	19.52	18.38	14.15	15.90	15.00
November	17.27	19.90	18.75	14.09	15.80	14.75
December	17.40	19.90	18.75	13.90	15.90	14.75

PRODUCTION OF STEEL BY STATES AND KINDS.

The following table shows the production of Bessemer steel ingots and castings in the leading States from 1906 to 1910, inclusive:

Production of Bessemer ingots and castings, 1906–1910, by States, in long tons.

State.	1906.	1907.	1908.	1909.	1910.
Pennsylvania	4,827,725	4,351,841	2,106,382	2,845,602	2,975,750
Ohio	3,769,913	3,636,679	1,955,446	3,466,077	3,314,053
Illinois	1,684,772	1,723,073	1,237,747	1,632,444	1,693,053
Other States	1,993,420	1,965,956	817,180	1,386,660	1,429,916
Total	12,275,830	11,667,549	6,116,755	9,330,783	9,412,772

In the following table is given the production of open-hearth steel ingots and castings in the leading States from 1906 to 1910, inclusive:

Production of open-hearth steel ingots and castings, 1906–1910, by States, in long tons.

State.	1906.	1907.	1908.	1909.	1910.
New England	251,047	239,797	158,417	257,392	223,158
New York and New Jersey	553,186	706,019	350,348	618,117	713,245
Pennsylvania	7,718,213	7,868,353	5,322,229	9,400,287	10,153,816
Ohio	818,683	819,642	525,171	1,424,452	1,733,409
Indiana	163,090	181,662	167,299	783,957	1,307,129
Illinois	884,472	1,013,251	483,104	1,052,572	995,011
Other States	591,722	721,012	830,161	957,159	1,378,741
Total	10,980,413	11,549,736	7,836,729	14,493,936	16,504,509

The following table gives the production, by States, of basic and acid open-hearth steel ingots and castings in 1910:

Production of basic and acid open-hearth steel ingots and castings in 1910, by States, in long tons.

State.	Basic open-hearth steel.	Acid open-hearth steel.	Total.
New England	179,422	43,736	223,158
New York and New Jersey	636,896	76,349	713,245
Pennsylvania	9,270,722	883,094	10,153,816
Ohio	1,636,971	96,438	1,733,409
Indiana	1,278,734	28,395	1,307,129
Illinois	983,895	11,116	995,011
Other States	1,305,689	73,052	1,378,741
Total	15,292,329	1,212,180	16,504,509

The following table gives the production of all kinds of steel ingots and castings in 1909 and 1910:

Production of all kinds of steel ingots and castings in 1909 and 1910, by States, in long tons.

State.	1909.				1910.			
	Bessemer.	Open-hearth.	Crucible and all other.	Total ingots and castings.	Bessemer.	Open-hearth.	Crucible and all other.	Total ingots and castings.
Massachusetts, Rhode Island, and Connecticut [a]	1,174	257,392	3,562	262,128	2,592	223,158	23,751	249,501
New York and New Jersey	602,046	618,117	34,930	1,255,093	740,529	713,245	34,856	1,488,630
Pennsylvania	2,845,602	9,400,287	63,900	12,309,789	2,975,750	10,153,816	77,973	13,207,539
Delaware, Maryland, District of Columbia, Virginia, West Virginia, Kentucky, Georgia, Alabama, Louisiana, and Texas	751,921	512,650	70	1,264,641	589,949	897,219	.....	1,487,168
Ohio	3,466,077	1,424,452	2,145	4,892,674	3,314,052	1,733,409	3,146	5,050,608
Indiana and Illinois	1,632,444	1,836,529	19,704	3,488,677	1,693,053	2,302,140	31,247	4,026,440
Other States	31,519	444,509	5,991	482,019	96,846	481,522	6,665	585,033
Total	9,330,783	14,493,936	130,302	23,955,021	9,412,772	16,504,509	177,638	26,094,919

[a] Figures for 1910 include Maine.

PRODUCTION OF ELECTRIC AND MISCELLANEOUS STEEL.

According to the statistics of the American Iron Trade for 1910, included in the total production of steel in 1910 there were 55,335 tons produced by various minor processes, including the electric process, as compared with 22,947 tons in 1909, an increase of 32,388 tons. Included in this total of 55,335 tons of steel, 52,141 tons of ingots and castings were made with electricity by 7 plants in Massachusetts, New York, Pennsylvania, Indiana, and Illinois, as compared with 13,762 tons made by 4 plants in 1909 in New York, Pennsylvania, and Illinois. In 1910 about 50,821 tons were ingots and about 1,320 tons were castings, and in 1909 13,456 tons were ingots and 306 tons were castings. Practically all the electric steel

was refined from metal taken from Bessemer converters and from open-hearth furnaces. On December 31, 1910, one additional plant for the manufacture of steel by electricity was being built, and several plants were being projected. Work on one of the projected plants has since commenced.

TOTAL PRODUCTION OF STEEL.

The statistics of the production of various kinds of steel, so far as has been recorded, are given in the following table. The first steel produced in this country was probably made in Connecticut in 1728 by Samuel Higley and Joseph Dewey. Crucible steel was first successfully produced in the United States in 1832 at the works of William and John H. Garrard, at Cincinnati, Ohio. Bessemer steel was first made in this country in September, 1864, by William F. Durfee at an experimental plant at Wyandotte, Mich., and open-hearth steel in 1864 by the New Jersey Steel & Iron Co. at Trenton, N. J.

Production of steel in the United States, 1810–1910, in long tons.

Year.	Bessemer.	Open-hearth.	Crucible.	Other steel.	Total.
1810	.....	.....	917		917
1860	.....	.....	11,838		11,838
1863	.....	.....	8,075		8,075
1864	.....	.....	9,258		9,258
1865	.....	.....	13,627		13,627
1866	.....	.....	16,940		16,940
1867	2,679	.....	16,964		19,643
1868	7,589	.....	19,197		26,786
1869	10,714	893	19,643		31,250
1870	37,500	1,339	29,911		68,750
1871	40,179	1,785	31,250		73,214
1872	107,239	2,679	26,125	6,911	142,954
1873	152,368	3,125	31,059	12,244	198,796
1874	171,369	6,250	32,436	5,672	215,727
1875	335,283	8,080	35,180	11,256	389,799
1876	469,639	19,187	35,163	9,202	533,191
1877	500,524	22,349	36,098	10,647	569,618
1878	653,773	32,255	38,309	7,640	731,977
1879	829,439	50,259	50,696	4,879	935,273
1880	1,074,262	100,851	64,664	7,558	1,247,335
1881	1,374,247	131,202	80,145	2,720	1,588,314
1882	1,514,687	143,341	75,973	2,691	1,736,692
1883	1,477,345	119,356	71,835	4,999	1,673,535
1884	1,375,531	117,515	53,270	4,563	1,550,879
1885	1,519,430	133,376	57,599	1,515	1,711,920
1886	2,269,190	218,973	71,973	2,367	2,562,503
1887	2,936,033	322,069	75,375	5,594	3,339,071
1888	2,511,161	314,318	70,279	3,682	2,899,440
1889	2,930,204	374,543	75,865	5,120	3,385,732
1890	3,688,871	513,232	71,175	3,793	4,277,071
1891	3,247,417	579,753	72,586	4,484	3,904,240
1892	4,168,435	609,889	84,709	4,548	4,927,581
1893	3,215,686	737,890	63,613	2,806	4,019,995
1894	3,571,313	784,936	51,702	4,081	4,412,032
1895	4,909,128	1,137,182	67,666	858	6,114,834
1896	3,919,906	1,298,700	60,689	2,394	5,281,689
1897	5,475,315	1,608,671	69,959	3,012	7,156,957
1898	6,609,017	2,230,292	89,747	3,801	8,932,857
1899	7,586,354	2,947,316	101,213	4,974	10,639,857
1900	6,684,770	3,398,135	100,562	4,862	10,188,329
1901	8,713,302	4,656,309	98,513	5,471	13,473,595
1902	9,138,363	5,687,729	112,772	8,386	14,947,250
1903	8,592,829	5,829,911	102,434	9,804	14,534,978
1904	7,859,140	5,908,166	83,391	9,190	13,859,887
1905	10,941,375	8,971,376	102,233	8,963	20,023,947
1906	12,275,830	10,980,413	127,513	14,380	23,308,136
1907	11,667,549	11,549,736	131,234	14,075	23,362,594
1908	6,116,755	7,836,729	63,631	6,132	14,023,247
1909	9,330,783	14,493,936	107,355	22,947	23,955,021
1910	9,412,772	16,504,509	122,303	55,335	26,094,919

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[a] Numbers of folios containing important notes on iron ores are printed in italics.

A DECADE IN UNITED STATES STEEL.

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INTRODUCTION.

The object of this booklet, entitled "A Decade in United States Steel," is to give the shareholders of the United States Steel Corporation, as well as investors, a clear insight into general operations and what has been accomplished by the world's largest industrial organization over the last 10 years. It seeks to point out the uses to which earnings have been put, actual assets, after sinking and depreciation funds charges, added to the property, the extent to which the corporation has safeguarded its shareholders, additional security placed behind the capital stock and bonds, and other developments either tending to enhance or take away from valuation.

The analysis shows that United States Steel actually added to value of assets from April 1, 1901, to December 31, 1910, after allowances for depreciation and sinking funds, $335,170,521. Depreciation and sinking fund allowances in the same period amounted to $531,639,000, and there was added to value of mineral holdings, through development and exploration work and acquisitions (not including the ore properties of the Tennessee Coal & Iron Co. and the Hill ore lands), a total of $350,000,000.

To December 31 last the United States Steel Corporation reported an aggregate gross business of $5,813,243,724 and total net earnings of $1,202,214,515 Wages paid exceeded total net earnings by approximately $112,000,000 and total dividend and interest payments by $654,000,000.

The surplus of the corporation available for dividends on the common has averaged 9 per cent a year. The balance, after all charges, before deducting dividends has averaged 20.5 per cent on the preferred stock. Capacity has been increased 80 per cent without adding anything to speak of in the way of fixed charges.

The downward tendency of steel prices has made heavy inroads upon the earnings of the corporation. Compared with 1902, there has been an average reduction in eight of the leading steel products of approximately $4.50 a ton. On a production as large as last year this would mean a difference in earnings to the Steel Corporation of nearly $50,000,000 a year. Earnings have been maintained more through higher operating efficiency and enlarged production than anything else. Operating costs have also been enlarged through a continued increase in wages since the inception of the corporation.

The contents of this booklet cover, among other subjects reviewed by the Wall Street Journal, the following: Increased earning power resulting from expenditures for new construction and higher operating efficiency; what has been charged against income to offset value that has gone out of property through deterioration, exhaustion of minerals, etc.; actual additions to assets after sinking fund and depreciation charges; fixed charges and preferred dividend payments compared with what they were at time of organization; increased value back of the capital stock; expenditures for new construction; sinking funds, depreciation, interest, and dividend charges; course of wages and steel prices; railroads of United States Steel compared with mileage of several important systems; earnings available for common stock since organization; security and earnings back of preferred stock; operating ratio; gross business and what it consists of; outlook for the next 10 years in way of earnings; production, etc.; output compared with steel production of European countries and independent steel concerns of United States; tons of steel produced per man; capitalization; quarterly earnings and earnings per ton of steel produced; steel stock sold to employees under profit-sharing plan; inventories; equipment owned; working capital; number of blast furnaces and steel plants; exports; possible effect of reduced steel duties; new bonds issued and retired; tons of various classes of steel produced, etc.

DOW, JONES & CO.

MAY, 1911.

The United States Steel Corporation, the greatest combination of capital and largest employer of labor in existence, rounded out a decade on March 31, 1911. The totals which it has piled up in the first 10 years' period guarantee it the un-

disputed right to the position of first place among the world's great aggregations of corporate wealth for many years to come.

The magnitude and strength of United States Steel is reflected in total net earnings from April 1, 1901, the date of organization, to December 31, 1910, of $1,202,214,515; an aggregate gross business of $5,813,243,724; wages paid $1,314,904,189; sales of over 85,000,000 tons of finished and semifinished steel, and dividend and interest payments, including subsidiary bonds, of approximately $660,000,000.

That the employees of the corporation have no apparent reason for complaint is evident from the fact that they were paid in aggregate wages a sum greatly in excess of total net earnings. They received $712,000,000 more than the stockholders and holders of United States Steel bonds. Still another indication that the Steel Corporation did not prosper through lower priced labor is found in the fact that the average wage per man in 1910 was $800, the highest level ever reached, comparing with $717 in 1902, and $720 in 1903.

The completeness and scope of the Steel Corporation's reports make possible some interesting comparisons and deductions over the last 10 years, as the tables accompanying this analysis will show. Chairman Gary's policy of publicity permits a more thorough insight into the general operations and affairs of the corporation than is possible in the case of most corporations.

Shareholders who wish to keep informed as to the progress and development of the respective corporations in which they have an interest usually seek information bearing upon the permanency of dividends and interest, whether prevailing rates are justified by earnings, the amount expended for new construction and general upkeep of the properties, additions to assets over depreciation and sinking-fund charges, dividends and interest, earning power, etc. The statements of the Steel Corporation are designed to enlighten its bond and stockholders on all these subjects.

At the beginning it will be found that the corporation has not only made liberal charges for depreciation, but has appropriated hundreds of millions of dollars for actual new construction work and replacements in order to keep pace with the world's consumptive requirements of steel products. On April 1, 1901, the date of organization, the corporation had a capacity for rolled and other steel and iron products "for sale" of 7,719,000 tons a year. At the present time its capacity is close to 13,750,000 tons a year.

In an informal talk to shareholders, at the annual meeting on April 17, Chairman Gary remarked: "When the United States Steel Corporation was organized, the total capacity of finishing mills was something like 23,000 or 24,000 tons per day. At the present time the producing capacity is nearly double that amount.

"Therefore, although the mills are not running to more than about 70 per cent to 73 per cent or 74 per cent of their capacity at the present time, you will see that this is very much more than the total capacity at the time the corporation was organized. The manufacturing capacity of the mills during the last 10 years has increased generally. The independents, so called, have increased their capacity a little more than we have increased our capacity. We started out with about 60 per cent of the total business of the country, and at the present time we have about 55 per cent on the average. It is our intention to keep the proportion up to about that point. We do not intend to have more than 60 per cent. We desire to avoid any question of monopoly."

This increase in capacity, amounting to approximately 80 per cent, as pointed out by Dow, Jones & Co., has been brought about without any additional burden to speak of in the way of fixed charges. As a matter of fact, the preferred dividend and interest payments of the Steel Corporation are to-day nearly $2,000,000 less than they were in 1902.

FIXED CHARGES AND BONDS OUTSTANDING.

This decrease is largely the result of the conversion of $150,000,000 of 7 per cent preferred stock into a similar amount of 5 per cent bonds. Because of this transaction there was a saving of $3,000,000 a year, representing the difference of 2 per cent yearly between the 5 per cent on the bonds and the 7 per cent on the stock converted. But in this connection it is interesting to note that had the preferred stock not been converted into bonds there would have been an actual increase of only $1,000,000 in outstanding bond, purchase money, mortgage, bills payable, and rental obligations.

The following table gives the preferred dividend and interest payments in 1902 and 1910, which bear out the above:

	1910	1902
Preferred dividend payments	$25,219,677	$35,720,177
Interest on United States Steel bonds	23,366,760	15,187,850
Interest on subsidiary bonds, purchase-money obligations, etc	7,263,452	6,846,427
Total	55,849,889	57,754,454
Net decrease	1,904,565	

The following table gives the increases or decreases in outstanding United States Steel bonds, bonds of subsidiary companies, mortgages, and purchase-money obligations from time of organization to December 31 last:

	Outstanding.		Changes.
	1911	1901	
United States Steel bonds	$465,189,500	$303,757,000	[1] $161,432,500
Subsidiary bonds	131,130,661	60,978,900	[1] 70,151,761
Mortgages, purchase money, etc	3,097,792	31,153,944	[2] 28,056,152
Total	599,417,953	395,889,844	[1] 203,528,109
Deduct $150,000,000 preferred stock converted into similar amount of 5 per cent bonds			150,000,000
Net increase			53,528,109

[1] Increase. [2] Decrease.

In connection with the changes in outstanding bonds it is necessary to add that the Steel Corporation has redeemed bonds which are held by trustees of sinking funds to the amount of $51,641,500. Interest accretions on these bonds which are necessarily paid into sinking funds are beginning to reach large proportions. For example, the total accretions and other receipts last year aggregated $2,420,094, of which $1,762,701 were from United States Steel bonds and $657,393 from subsidiary bonds.

As the Steel Corporation has not burdened itself with any great amount of fixed charges through construction work, idle plants in periods of depression are not the expense they would be had they been built with borrowed money. The only charge attached is the necessary allowance for depreciation. Then, again, concentration of operations and the construction of new works at more advantageous points of consumption should result in much greater economies of manufacture.

NEW CONSTRUCTION.

The Steel Corporation from date of organization to December 31 last expended for new construction $362,452,383 and for extraordinary replacements $113,361,931, a total of $475,814,314. This total amount, with the exception of $61,733,000, was provided from the current earnings and surplus of the organization. The $61,733,000 represents moneys realized from the sale of bonds, mortgages, and purchase-money obligations of subsidiary companies.

Extraordinary replacements, however, can not be classed as actual new construction. Appropriations for this purpose are utilized for the rehabilitation of departments and plants through entire rebuilding or rearrangements and installation of labor-saving devices, etc. They are designed to provide for the current depreciation and obsolescence which are constantly taking place in physical conditions of a property. The $362,452,383 expended for new construction was for actual new plants, such as those located at Gary, Ind., the total expenditures on the latter to date amounting to approximately $70,000,000.

The increase in the Steel Corporation's capacity comes almost entirely from expenditures of the stated $362,452,383 for new construction, the acquisition of the Union and Clairton Steel Cos. and the Tennessee Coal, Iron & Railroad Co. The acquisition of the three companies mentioned involved an outlay of something like $80,000,000 in bonds. The combined finished steel capacity of

these three companies at time of acquisition amounted to 1,143,000 tons, and the remaining increase of approximately 5,000,000 tons resulted from expenditures from earnings for new construction. In connection with the acquisition of the Union and Clairton Steel Cos. and Tennessee Coal, Iron & Railroad Co., it is only fair to state that at time of acquisition their combined blast furnace capacity was 2,228,000 tons, a figure considerably in excess of finished steel capacity.

There are various methods of arriving at an estimate of the actual addition to the assets of the Steel Corporation since organization. A number of writers in making their estimates have included depreciation, embracing sinking funds and extraordinary and special replacements. As the moneys appropriated for such purposes are used entirely to offset deterioration of plants, exhaustion of minerals, etc., they can hardly be regarded in the light of actual additions to property assets.

The proper way would seem to be as follows, so far as actual additions to assets are concerned:

Undivided surplus on hand Dec. 31, 1910	$164,143,157
Deduct surplus provided at organization	25,000,000
Balance	139,143,157
Add appropriation from surplus to cover capital expended	40,000.00
Balance	179,143,157
Payments from surplus for property constructed, etc	156,027,364
Balance	335,170,521

The final balance is equivalent to approximately $66 a share on the common stock outstanding.

From April 1, 1901, to December 31 last there was appropriated from earnings $265,639,000 for depreciation and sinking funds, not including ordinary repairs.

DEPRECIATION ALLOWANCES.

An analysis of the annual reports of the United States Steel Corporation since organization seems to indicate that allowances from earnings for depreciation have been liberal, comparing favorably with charges made by other corporations. An increase is shown each year. Last year, for example, they reached $71,198,000 (including ordinary repairs), comparing with $25,960,000 in the last nine months of 1901, $48,800,000 in the full year 1902, $67,800,000 in the boom year of 1907, and $49,300,000 in the depressed year of 1908. In the first nine months of the corporation's existence depreciation charges, including ordinary repairs, were equivalent to 1.8 per cent of the property account; in 1902, 2.7 per cent; in 1903, 3.7 per cent; and in 1904, 2.6 per cent. In 1910 they established a new high record, reaching $71,198,000, or 5 per cent of the property valuation.

The following table gives the aggregate allowances from gross income for depreciation, together with the per cent of such allowances to property account from time of organization to date, to cover deterioration arising from wear and tear of improvements, exhaustion of minerals, and for obsolescence:

	Depreciation and sinking funds.	Ordinary repairs.	Total.	Per cent depreciation to property account.
1910	$30,198,000	$41,000,000	$71,198,000	5.0
1909	29,349,000	35,000,000	64,349,000	4.3
1908	22,350,000	27,000,000	49,350,000	3.3
1907	32,857,000	35,000,000	67,857,000	4.7
1906	35,565,000	29,000,000	64,565,000	4.7
1905	28,046,000	24,000,000	52,046,000	3.8
1904	18,207,000	18,000,000	36,207,000	2.6
1903	29,293,000	22,000,000	51,293,000	3.7
1902	27,814,000	21,000,000	48,814,000	2.7
1901	11,960,000	[1] 14,000,000	25,960,000	1.8
Total	265,639,000	266,000,000	531,639,000	.....

[1] Estimated.

In consideration of the corporation's investment in fixed property and the fact that a very large proportion of this investment is in iron ore, fuel, and other minerals, which is being exhausted at a rate probably not more than 2 per cent a year, together with the large amount of the capital invested in railroads, steamships, etc., the conclusion could be reached that depreciation allowances have been fair. Accordingly, it follows that to the extent that it invests its surplus remaining after providing for depreciation allowances in plants and new property, the expenditures for new construction from income constitute a new increased value added to property.

It will be observed from the above table that United States Steel in nine and three-quarter years made the large depreciation allowance of $531,639,000, equal to more than 37 per cent of the present property valuation of $1,430,000,000.

Allowances of $71,200,000 last year were at the rate of $712,000,000 every 10 years, equal to about 50 per cent of the present property valuation.

After all depreciation charges, dividends, interest, etc., the corporation shows a balance carried forward to surplus of $326,153,000 (not including the $25,000,000 surplus provided at time of organization), against which there are various charges, mostly for new construction, of approximately $209,651,000. The final surplus after these charges is $164,143,000, including the $25,000,000 working capital provided at date of organization, and $22,681,554 subsidiary-company surplus.

The large sums the Steel Corporation has spent for new construction, together with depreciation charges and actual additions to assets, make it evident that the physical and financial position of the company is being well taken care of.

ACTUAL INCREASE IN ASSETS.

In connection with depreciation charges it is generally understood that the Steel Corporation charges off at the rate of more than 10 per cent a year for steel-plant and blast-furnace deterioration. With a 50-year iron ore and fuel supply, depreciation charges on mineral lands owned are proportionately small. The allowance for railroad and steamship depreciation is also considerably less than in the case of mills, furnaces, etc. Besides, it is generally understood that the Steel Corporation's "proven iron-ore tonnage" is larger to-day by 300,000,000 or 400,000,000 tons than it was at time of organization, notwithstanding that it consumed close to 200,000,000 tons in the last 10 years. The greatest percentage of this increase resulted from development and exploration work, the remainder from acquisitions. The Great Northern and Tennessee Coal & Iron properties do not figure in the foregoing calculation.

With the facts, figures, and deductions above it is possible to summarize what the Steel Corporation has accomplished since organization in the way of allowances from income for depreciation, actual additions to assets from income, and increased value of "proven" supply of ore holdings, as follows:

Depreciation allowances:		
Expenditures for ordinary repairs from gross income	$266,000,000	
Depreciation and sinking funds	265,639,000	
Total		$531,639,000
Actual additions to assets:		
Undivided surplus (less $25,000,000 provided at time of organization)	139,143,157	
Appropriated surplus to cover capital expended	40,000,000	
Payment of capital obligations and construction from net income	156,027,364	
Total actually added to value of assets after allowance for depreciation as above		335,170,521
Increased iron-ore valuation:		
Increase in "proven" iron-ore holdings from time of organization to date, based upon $1 a ton		350,000,000
Total		1,216,809,521

The above table shows that $531,639,000 has been allowed for depreciation, which has been utilized for losses sustained through exhaustion of minerals

and general deterioration. The $335,170,521 represents a new increased value added to property in the way of undivided surplus, expenditures, and appropriations for new construction, etc. The $350,000,000 is the added value of "proven" ores based upon an increase of 350,000,000 tons. In explanation, Charles M. Schwab, at time of organization, estimated that the Steel Corporation had a visible ore supply underground of 700,000,000 tons, compared with the present estimate of between 1,000,000,000 and 1,100,000,000 tons. The $1 per ton valuation is based upon the approximate royalty which the United States Steel Corporation is paying for use of the Hill ores this year. The Hill properties are supposed to contain approximately 300,000,000 tons of iron ore, and the Tennessee Coal & Iron Co.'s holdings are estimated at 700,000,000 tons. making a grand total of about 2,000,000,000 tons of possible iron ore underground controlled by the United States Steel Corporation. As the corporation to date has consumed at the rate of only 20,000,000 tons a year there need be no apprehension over future supplies of raw material.

Adding the increased value in ore holdings through exploration and development work and acquisition, exclusive of the Tennessee Coal & Iron and Hill deposits, to the $335,000,000 actual value added to assets from income, gives a total of approximately $685,000,000.

The total of $1,216,809,521 is simply given in order to show what the corporation has carried to undivided surplus, charged out of income for depreciation and construction, and added to value through increased mineral holdings; all this total, as explained above, by no means representing an actual addition to assets.

INCREASE IN CAPACITY.

The net result of the corporation's expenditures for new construction, acquisitions, etc., according to the Wall Street Journal, has been the stated increase in the capacity of finished steel products "for sale" from 7,719,000 at time of organization to 13,750,000 tons; steel ingots from 9,425,000 to 18 000,000 tons, and blast-furnace capacity from 7,440,000 to 16,000,000 tons. This is an inincrease of 78 per cent, 91 per cent, and 115 per cent, respectively, from time of organization to date.

From these figures it is possible to estimate the increase in the earning power of the corporation since organization. The ratio of total earnings per ton of steel produced since 1901 has averaged approximately $14. Therefore, on this basis, the earning power at time of organization would have been $108,100,000, comparing with $192,500,000 at the present time, an increase of approximately 80 per cent. In this connection, however, it is well known that the tendency of steel prices has been downward since the organization of the Steel Corporation and wages upward, so that on this basis earning power is now considerably less per ton of steel produced than it was in 1901. For example, the ratio of total net earnings per ton of steel produced "for sales" in 1902 was $16.25, the highest level reached in any year since organization. The second highest level reached was in the boom year of 1907, when the ratio was $15.24; in 1910 it was $13.14. The earning power on a capacity of 13,750,000 tons of finished steel "for sale," based on last year's ratio of $13.14 per ton, would be approximately $180,000,000 a year.

The problem that now confronts the Steel Corporation, as well as other steel companies, is whether or not the consumptive requirements of the country have increased to a point sufficient to absorb the increased capacity which has been growing at a rapid rate over the last five years. The concensus of opinion is that it will be several years before consumption catches up with present capacity, but the outlook does not seem to discourage the Steel Corporation so far as plans for additional new construction are concerned.

QUESTION OF OVERPRODUCTION.

In this connection Chairman Gary said: "By the rapid increase in production we have reached a point where, as applied to the business which is offered at the present time, we have rather more capacity than we need. That is true of all the manufacturing plants in our lines at the present time. However, all of us believe that we have not increased too rapidly, but that it is merely a question of time perhaps when the mills will be running to their full capacity.

"As usual, the introduction of bills in Congress, particularly bills relating to the tariff, has an effect upon the purchasing public which causes some doubt or distrust and timidity, and that is true of the present extra session of Congress.

"The bookings which I have referred to have been made up of purchases of our products generally pretty well distributed, except with reference to the lines which the railroads have been in the habit of buying. As you know, notwithstanding that the railroads usually buy about 33⅓ per cent of the entire products, for some time past they have been buying only about 7 per cent or 8 per cent. As the railroads have neglected to purchase during the last year or so, it naturally follows that their necessities have correspondingly increased and piled up. It is only a question of time when they must buy liberally."

Chairman Gary, in his last annual report, makes the statement that the amount unexpended on authorizations for additional property, extensions, construction, and extraordinary replacements approximated $50,000,000, and that a large percentage of this total will be expended in the current year. Additional blast-furnace construction in the United States, based upon statistics furnished in January, may be as large this year as in preceding years. But there are grounds for the belief that expenditures for new construction by the Steel Corporation and independent steel companies will be much smaller in the next five years than they were in the preceding five years. Since 1904 it is estimated that there has been expended or appropriated for new blast-furnace and steel-mill construction in this country close to $500,000,000. The Steel Corporation's share was not far below 50 per cent of the total.

STEEL PRICES COMPARED.

Overproduction may have a considerable bearing upon the future course of steel prices, but it can be said that, under the "harmony of relations" plan of maintaining reasonable and stable quotations, prices in recent years have been held very well in periods of depression. With the exception of the temporary price war, which started in February, 1909, prices have not been allowed to decline to a level disturbing to the steel industry in general.

However, the tendency of steel prices has been downward since the organization of United States Steel. In 1902, for example, the average price for ship plates, Pittsburgh was $35.84 a ton, compared with $32.62 a ton in 1910. The present price is $31.36. In the boom period of 1907 the average price was $38.08, so that to-day's quotation is approximately $7 a ton below what it was a little over three years ago. Wire nails to-day are selling on a basis of $40.32 a ton, compared with $45.02 in 1907, and $50.40 in 1901.

Steel bars show a reduction of $4.50 a ton compared with the yearly average in 1907, and more than $6 a ton compared with the yearly average in 1902. Beams are off nearly $7 a ton from the yearly average of 1907 and 1908, and $4 a ton from the yearly average of 1901 and 1902. The present price of tin plate, $82.88, compares with the yearly average of $87.96 in 1907 and $89.60 in 1901. Steel billets are off $7 a ton compared with the yearly average of 1902 and nearly $6 a ton from the average of 1907.

In 1907 the yearly average price of eight steel and iron commodities, namely, steel rails, ship plates, wire nails, steel bars, beams, tin plate, Bessemer iron and steel billets, was $40.63 a ton. The average price on May 1, 1911, for the same products was $35.50, so that the average reduction amounts to approximately $5 a ton. Since 1902 the average shrinkage of the eight commodities above mentioned amounts to about $4.50 a ton.

Assuming that the Steel Corporation turned out and sold on an average 10,000,000 tons of steel a year, this difference in average prices from 1902 to the present time would theoretically mean a shrinkage in total net earnings of $4.50 a ton, or $45,000,000. The Steel Corporation, as has been stated, has advanced wages of its employees in the face of a continued shrinkage in the prices of its commodities. This increase in wages, combined with the reduction in the price of steel, is responsible for the failure of the company to make as good a showing in income from the standpoint of earnings per ton of steel as was the case in the first two or three years after its organization. Consumers have received the benefits derived from this shrinkage in steel prices, and it is because quotations compared with former years are so low that producers are reluctant to make further concessions from the present level. Earnings of the Steel Corporation have been obtained more through enlarged production and higher operating efficiency than from enhanced prices of steel products.

An evidence of the larger amount of the Steel Corporation's earnings going to employees is found in the fact that the average wage per man in 1910 established the new high record of $800 a year, comparing with $717 in 1902, an increase of 12 per cent.

The following table, published by the Wall Street Journal, gives the average yearly prices per gross ton of eight leading steel products from 1901 to 1910, inclusive, together with the so-called official prices as of May, 1911, in dollars:

Year.	Steel rails.	Ship plates, Pittsburgh.	Wire nails, Pittsburgh.	Steel bars, Pittsburgh.	Beams, Pittsburgh.	Tin plate mill.	Bessemer iron. Pittsburgh.	Steel billets, Pittsburgh.	Average.
1911.....	28.00	31.36	40.32	31.36	31.36	82.88	15.75	23.00	35.50
1910.....	28.00	32.60	40.09	32.03	32.92	80.64	17.19	25.39	36.11
1909.....	28.00	31.70	40.70	29.56	31.58	78.40	17.41	24.58	35.24
1908.....	28.00	36.84	44.35	33.15	36.73	82.88	17.07	26.31	38.17
1907.....	28.00	38.08	45.02	35.84	38.08	87.96	22.84	29.23	40.63
1906.....	28.00	35.84	41.56	35.39	38.08	88.56	19.54	27.41	39.29
1905.....	28.00	35.61	39.42	35.39	35.28	78.40	16.36	24.69	36.64
1904.....	28.00	34.52	40.32	29.56	34.49	76.38	13.76	22.08	34.89
1903.....	28.00	35.84	44.12	34.94	36.84	89.76	18.88	27.93	39.54
1902.....	28.00	35.84	44.57	37.40	35.38	88.03	20.15	30.32	39.96
1901.....	27.40	34.87	50.40	32.92	35.39	89.60	15.72	24.13	38.80

NOTE.—1911 prices represent present prices.

CAPACITY AND PRICES.

To go back to the increased capacity of the Steel Corporation, the following table gives one a good idea of what has been accomplished in this connection since time of organization:

Product.	Capacity.		Per cent increase.
	Jan. 1, 1911.	Apr. 1, 1901.	
Blast furnace.....tons..	16,000,000	7,440,000	115
Steel ingots.....do....	18,000,000	9,425,000	91
Finished steel.....do....	13,750,000	7,719,000	78
Cement.....barrels..	8,000,000	500,000	1,500

With a capacity almost twice as large as it was at time of organization and an actual addition of more than $350,000,000 to assets, the general conclusion would be that average dividends at the rate of 7 per cent on the preferred stock and 5 per cent on the common were assured. The argument of investors who are confident the trend of common dividends over the next decade will be upward is that, as the corporation started the first 10 years of its career with a finished steel capacity "for sale" of 7,719,000 tons a year, and during that decade showed an average surplus of more than 9 per cent available for dividends on the common stock, it should make a much better showing during the next 10 years, as it begins its second decade with a capacity close to 14,000,000 tons. But in this connection earnings have not grown proportionately with increased capacity, due largely to the downward tendency of steel prices, a continued advance in wages, and other factors tending to increase costs, and the failure of consumers over the last several years to keep the steel mills fully employed. As an example, sales of the corporation's steel products last year were about 3,000,000 tons below actual capacity. If the corporation spends $50,000,000 for new construction this year it may have a finished steel capacity of 14,500,000 tons by January 1, 1912; and with a corresponding increase in the capacity of the independent companies, it is doubtful if consumption catches up with capacity within the next few years. If consumption does overtake capacity this or next year, then the country can prepare itself for the biggest steel boom in its history. Prices could not fail to advance materially above the present level, and the Steel Corporation could then give its earning power a test and prove whether, as asserted, it can easily earn $200,000,000 a year with reasonable prices and normal operations. The corporation has already demonstrated an earning power in excess of $200,000,000 a year. For example, in October, 1907, when capacity was much smaller than it is at present but steel prices much higher, it earned over $17,000,000, which was at the rate of close to $205,000,000 a year.

EARNING POWER.

The record of the Steel Corporation in the matter of earnings over the last 10 years has been encouraging. In no full year has the net income fallen to a level not sufficient to meet preferred dividend requirements. The nearest approach to the danger mark was in the depressed year of 1904, when there remained a surplus a little in excess of $5,000,000 after the payment of 7 per cent on the preferred. The corporation, from 1901 to date, could have paid 5 per cent on the common stock each year and then there would have remained a surplus averaging more than $20,000,000 a year.

An evidence of the earning power behind the preferred and common stocks of the Steel Corporation is found in the fact that it required from net earnings to pay all charges prior to dividends on both issues, in the year 1910, $53,647,571, or an average of $13,411,892 for each quarter; and from April 1, 1901, to January 1, 1911 (nine and three-quarters years), it required $480,901,674, or an average of $12,330,812 for each quarter.

Assuming $53,647,571 as necessary to deduct from net earnings as above per year (for depreciation and replacement funds, interest on bonds, and requirements of sinking funds), it will be observed from past record of net earnings that this amount was earned in: 1906 in first 4½ months; 1907 in first 4 months; 1908 in first 8 months; 1909 in first 6 months; 1910 in first 6 months.

The feeling in United States Steel circles is that the greater part of the water injected into the property at time of organization has been eliminated, and that in periods of temporary depression it will be only fair to shareholders to resort to bond issues for new construction, if necessary, in order to maintain the 5 per cent rate on the common. The corporation has already issued a comparatively small amount of subsidiary bonds for new construction, but bond redemptions last year exceeded by more than $10,000,000 the new issues created during that period.

THE COUNTRY'S IRON OUTPUT.

What the next 10 years has in store for the United States Steel Corporation and the steel industry in general can not be foretold. If the growth of the industry is as pronounced over the next 10 years as it was over the last 10 years, and prices are as well maintained, nothing less than record earnings and a pronounced increase in production and consumption can be looked for. As an example, pig-iron production 10 years ago was running at the rate of about 16,000,000 tons a year. Last year the output of the country reached the new high record of approximately 27,000,000 tons. The blast furnaces of the country with their present capacity are in a position to turn out not far from 32,000,000 tons a year, making allowances for banking of furnaces, for relining, and other necessary repairs. If the growth in production over the next decade is as pronounced as it was in the last 10 years, the blast furnaces of the country, in the year 1920, will find no difficulty in turning out between 40,000,000 and 50,000,000 tons a year.

Possible tariff changes and overproduction are the two important adverse factors confronting the steel industry which may create a lower level for steel prices, but the various steel concerns are in a better position to stand a long period of low prices than they have been in years. In the event of lower prices the Steel Corporation would be more strongly fortified than many of the independent companies. Its ratio of net earnings (after deductions for depreciation and sinking funds for subsidiary bonds) per ton of steel produced and sold has ranged between $9 and $13 since organization. The ratio of the independent companies has averaged between $2 and $6 a ton. In this connection, however, it is well understood that the Steel Corporation's large ratio of earnings per ton is due to the greater diversification of its products and earnings from companies that are not directly associated with the manufacture of steel. Its railroads, which have a total mileage, including spurs, sidetracks, etc., of 3,307 miles; its 203 steamers and barges, cement plants, interest on bank balances of $50,000,000 or more, etc., constitute a large percentage of the total income of the corporation.

In connection with capacity, manufacturers feel confident that, while the expansion has been a little too rapid over the last five years, consumption within a few years will be able to take care of present capacity at least. Prices for steel have declined to a point sufficient to bring forth the argument that any further reaction would be temporary, and might be followed by a quick recovery.

SURPLUS FOR COMMON STOCK.

The greater concentration of steel production at western points has strengthened the fortifications of the United States Steel Corporation against an invasion of foreign steel into this country. It has already spent $70,000,000 on its Gary plants, added largely to the capacity of the Illinois Steel Co. plants, and is now building a great steel plant at Duluth. These three subsidiaries, when the work planned is completed, will have a capacity of over 4,000,000 tons of finished steel a year. With other western plants owned by the corporation one-third, if not more, of its production will be centralized in the Middle West, thereby giving it a great advantage in freight rates in competition with steel laid down at Atlantic seaports for shipment to western points. When the Steel Corporation was organized most of its production was confined to Pennsylvania and Ohio.

It required about $104,000,000 of the Steel Corporation's earnings last year to meet all charges, including the 5 per cent dividend on the common. In a depressed year the company could probably get through, without reducing the common dividend, on total earnings of slightly less than $100,000,000. It would be helped out by smaller charges against earnings for depreciation, as exhaustion of minerals is much less pronounced in depressed periods than when the mills are fully employed.

The following table gives the total net earnings, actual surplus available for the common stock, and the final surplus that would have remained each year since organization had 5 per cent been paid on the common stock each year from 1901 to 1910, inclusive.

Year.	Net earnings.	Surplus for common.	Per cent surplus for common.	Surplus after 5 per cent on common.
1910	$141,054,755	$62,187,508	12.20	$36,772,383
1909	131,479,475	53,854,017	10.60	28,438,892
1908	91,847,710	20,509,036	4.00	[1] 4,906,089
1907	160,964,670	79,345,986	15.60	53,930,761
1906	156,624,273	72,908,909	14.30	47,493,784
1905	119,787,658	43,365,315	8.50	17,950,690
1904	73,176,521	5,047,352	1.00	[1] 20,367,273
1903	109,171,152	25,012,478	5.00	[1] 402,647
1902	133,308,763	54,586,347	10.70	29,171,222
1901	[2] 84,787,596	[2] 33,846,000	[2] 6.60	[2] 8,430,750

[1] Possible deficit had 5 per cent been paid on common. [2] Nine months.

From the above it is plain that the corporation, had it paid 5 per cent on the common each year since organization, would still have been able to show a surplus at the rate of more than $20,000,000 a year. Then again there would have been only three years to show a deficit, namely, 1903 with $402,647, 1904 with $20,367,273, and 1908 with $4,906,089.

PERCENTAGE OF OUTPUT OF CORPORATION.

A great deal has been written about the growth of the Steel Corporation's production, compared with the increase in the output of the independent companies. It is claimed that the Steel Corporation's relative position, from the standpoint of percentage production to that of the country's total, is not as strong as it was 10 years ago. In other words, the aggregate increase in the output of the independent companies has been greater, proportionately, than that of the Steel Corporation. Based upon production over the last decade, United States Steel does show a falling off from 66.2 per cent to 54.3 per cent in the percentage of its ingot production to the country's total; but this is not absolute proof that the "capacity" of the corporation has been reduced proportionately.

It will be recalled that the independent companies for the past few years have been credited with operating, on the average, a larger percentage of capacity than the corporation. In the latter part of last March, for example, the Steel Corporation was operating about 72 per cent of maximum capacity, whereas the independent steel companies were reporting between 80 and 90 per cent. The steel mills of the country would have to operate in full for a long period

In order to demonstrate beyond a doubt the extent of the Steel Corporation's loss in actual per cent capacity compared with the country's total capacity. The evidence presented to show that the corporation is less of a monopoly than 10 years ago is that its actual ingot production in 1902 was equivalent to 66.2 per cent of the country's total, compared with 54.3 per cent last year. But in the matter of pig-iron production the Steel Corporation seems to have held its own, the range over the last 10 years being around 44 per cent. The corporation's percentage of blast-furnace production, for example, was 43.2 per cent in 1902, and 44.5 per cent in 1910. In this connection it will be recalled that United States Steel in the earlier years of its existence did not have sufficient pig-iron capacity to supply its own finishing mills, and was a purchaser in the open market to the extent of between 500,000 and 1,000,000 tons a year. With the increase in iron capacity from 7,740,000 tons in 1901 to 16,000,000 tons in 1911, it is now independent. The withdrawal of United States Steel and several of the other large steel-making companies from the iron market is largely responsible for the depressed condition of the merchant blast furnaces. With these large consumers out of the market, as a result of the creation of their own sources of iron supply, the merchant furnaces have been having a hard time of it over the last few years.

One reason for the falling off of the Steel Corporation's percentage of ingot production is the increasing percentage of ingot tonnage that enters into its more highly finished forms of steel.

DIVERSIFICATION OF PRODUCTS.

Since organization, United States Steel's policy has been for a greater diversification of its products, particularly highly finished forms. Therefore, a great part of the finished steel converted from ingots commands higher prices than does that converted into rails, structural shapes, plates, etc., and at the same time gives employment to many additional men. As is well known, a greater percentage of the ingot is lost in its conversion into the more highly finished lines. The corporation shows a decrease in the tonnage of billets and other semifinished lines marketed. As an example, sales of billets, blooms, sheet bars, etc., in 1910 amounted to 682,364 tons, compared with 783,637 tons in 1902. Wire sales show an increase from 1,122,000 tons in 1902 to nearly 1,500,000 tons in 1910.

The following table gives the Steel Corporation's production of the various classes of steel "for sale" in 1902 and 1910:

Finished products.	1910	1902
	Tons.	*Tons.*
Steel rails	2,118,473	1,920,796
Blooms, billets, sheet bars, etc	683,364	782,637
Plates	929,020	649,541
Merchant steel bars, skelp, hoops, etc	1,527,506	1,254,560
Heavy structural shapes	656,797	.....
Tubing and pipe	868,550	744,062
Wire rods	133,722	109,330
Wire and products of wire	1,490,318	1,122,809
Sheets and tin plate	1,082,787	783,576
Finished structural work	589,228	481,029
Angle, splice bars, and joints	235,998	139,954
Spikes, bolts, nuts, and rivets	71,326	42,984
Axles	101,066	136,787
Steel car wheels	96,105	.....
Sundry iron and steel products	148,735	29,177
Total finished products	10,733,995	8,197,232

A feature of the above showing is the constant increase in wire production. There has been a continued expansion in output with the exception of two years.

Merchant steel bars and shapes also show a large increase, due in part to the increased demands of the harvester companies. The latter classes of steel were grouped together in 1902. They were separated later on and are now classified under the heads of "merchant steel bars, skelp, hoops, etc.," and "heavy structural shapes." The total in 1902 was 1,254,560 tons, comparing with 2,184,303 tons last year.

The following table gives the percentage production of various classes of steel to the total finished steel output "for sale" of the United States Steel Corporation in the years 1910, 1907, and 1902:

	1910	1907	1902
Rails	19.7	16.7	23.4
Wire	15.1	15.5	15.0
Steel bars, hoops, etc	14.3	12.7	15.3
Tinplate, sheets, etc	10.0	10.3	9.5
Finished structural work	5.5	6.9	5.8
Plates	8.7	8.4	7.9
Tubing and pipes	8.1	11.3	9.0
Blooms, billets, etc	6.3	7.3	9.5
Heavy structural shapes	6.1	5.6	.....
Miscellaneous steel [1]	6.2	5.3	4.6
Total	100.0	100.0	100.0

[1] Includes angles, splice bars, spikes, bolts, nuts, axles, steel car wheels, and sundry iron and steel products.

OUTPUT COMPARED WITH FOREIGN COUNTRIES.

The actual production of the Steel Corporation has not shown a large increase when the fact is taken into consideration that capacity has been increased to the extent of 80 per cent. But, as stated, the consumption of the country has not yet increased to a point that would enable the corporation to fully employ its mills. The completion of the Gary plants, for example, means an additional 2,500,000 tons, including capacity, in the present partly completed state of the works.

The magnitude of the Steel Corporation's operations is shown by comparing its ingot production over the last few years with that of the four great steel producing countries—the United States, Germany, United Kingdom, and France. The Steel Corporation, in fact, is producing several million tons more ingots a year than Germany, and twice the tonnage of the United Kingdom. The ingot capacity of the United States Steel Corporation, amounting to 18,000,000 tons a year, is within 3,000,000 tons of the entire production of the United Kingdom, Germany, and France in 1909.

The following table gives the ingot output of the United States, Germany, France, and the United Kingdom, in 1907, 1908, and 1909, compared with output of the United States Steel Corporation, in tons:

	1909	1908	1907
United States	23,955,000	14,023,000	23,363,000
Germany [1]	11,856,000	11,007,000	11,870,000
United Kingdom	5,931,000	5,341,000	6,522,000
France	3,020,000	2,679,000	2,706,000
Total	44,762,000	33,050,000	44,461,000
United States Steel Corporation	13,355,000	7,838,000	13,343,000
United States Steel's percentage to total	30	24	30

[1] Includes Luxemburg.

The ingot production of United States steel in 1910 amounted to 14,180,000 tons.

The largest competitors of the Steel Corporation are the Lackawanna Steel Co., Jones & Laughlin Co., Bethlehem Steel Corporation, Republic Iron & Steel Co., Pennsylvania Steel Co., and Cambria Steel Co. These six companies have a pig-iron capacity of less than 6,000,000 tons a year, or about 38 per cent of the 16,000,000-ton capacity of the Steel Corporation. The largest competitor of the Steel Corporation, perhaps, is the Jones & Laughlin Steel Co., but its capacity is barely equivalent to 7½ per cent of that of the big company.

There is not a steel company in this country with the relative strength of the Steel Corporation in iron-ore holdings, vessels, railroad mileage and equipment, cement, and other sources of income. There has been considerable gossip of late in connection with a proposition to merge certain of the prominent

independent steel companies. The large independents have grown so rapidly in steel production as to become a little unwieldy, and a merger such as proposed might work for greater stability, but no merger in this country could be formed that would give it an equal footing with the Steel Corporation in raw material, transportation lines, and the many sources of income that are not directly associated with the manufacture of steel.

INCREASED EXPORT TRADE.

One of the greatest achievements of the United States Steel Corporation has been the building up of a large export business. Progress in the matter of opening foreign markets for a percentage of the output of the corporation has been rapid over the last few years, and exports now make up between 10 per cent and 15 per cent of products "for sale." In 1908 the United States Steel Corporation exported 799,000 tons; in 1909, 1,009,000 tons; in 1910, 1,223,000 tons, and the current year starts off with prospects of close to 1,500,000 tons. It is true that the margin of profit on steel sold for export is not as large as in the case of domestic sales, but at the same time benefits from this class of business are not lacking.

Export business keeps plants that might otherwise be idle in operation and tends to lower cost of production as well as the prices of steel sold to the domestic consumer. Last year export business constituted about 13 per cent of total shipments and the average number of employees of the corporation was 218,000. It would seem, therefore, that foreign shipments were responsible for the employment of between 25,000 and 30,000 men. At times it is deemed proper by the corporation to sell steel for export below the domestic costs. While such a policy may not meet with the tariff views of all, it has provided an outlet for steel in depressed periods and kept thousands of men employed who might otherwise have been idle if the business had been confined to this country alone. It has been the aim of the management of the corporation to build up a permanent export trade so that foreign markets can be relied upon to take a certain percentage of output at all times.

The growth of the corporation's export business shows conclusively that it is becoming firmly entrenched in foreign markets, and in the event of a radical scaling down of duties on steel may become an even more formidable competitor of European steel companies. With a capacity not far below the aggregate production of Germany and the United Kingdom, it is a factor to be reckoned with. Europe may be able to produce steel cheaper than the Steel Corporation at the present time, but this is due largely to the difference in the cost of labor. The corporation pays out in wages each year a sum far in excess of its total earnings. A severe cut in steel duties might be followed by a drastic scaling down of the corporation's wage schedule and operating costs in general, which would place it in a much stronger position to meet competition from its foreign rivals. But this is a problem more easily solved after Congress has revised the steel schedule—that is, if there is to be any revision. To sum up the situation, the corporation seems to be in a position to fairly meet any contingency that may arise from a scaling down of steel schedules. Profits and wages might be adversely affected, but the ability of foreign manufacturers to make heavy inroads into the steel business of the United States is open to question. The corporation has already established a strong foothold in foreign marts and it would require very low foreign steel prices to dislodge it from its position.

WAGES AND TONNAGE.

Some interesting deductions can be made from United States Steel's average yearly wages, number of men employed, and steel production. Taking the average finished steel "for sale" production per total number of men employed, it is found that in 1902 the average output per man was 49 tons. On account of the many labor-saving devices introduced, concentration of operations, and increased production, the conclusion would be drawn that the average production of finished steel per man ought to show an increase; but it is found that the figure in 1910 is the same as in 1902, namely, 49 tons. One explanation advanced is that the corporation is producing a larger percentage of highly finished steel "for sale" to total output than at time of organization, which accounts largely for the similarity of the figures. For example, the corporation

could market its billets and the tonnage sold would be practically the same as if these same billets were converted into, say, wire products. If it were decided to erect wire mills to absorb these billets, more mills would be necessary and additional men would have to be employed to operate them. The finished steel "for sale" production per man reached the highest level in 1906, when 52 tons were reported, and the lowest level was in 1908, with 38 tons.

Finished steel production per man employed in manufacturing plants only has followed the course of finished steel production per all men employed by the corporation very closely. For example, in 1902 production "for sale" to total number of employees in the manufacturing departments only was 65 tons. There was a jump to 72 tons in 1906, the highest level ever reached. Last year the figure was 63 tons.

Production of iron ore per man employed in the ore mines only makes a better comparison. Or produced per man in 1902 averaged 592 tons, from which there has been a steady increase, the figure reaching 786 tons in 1910. A similar gain is reported in the coal and coke department. Average production per man employed in 1902 was 1,193 tons, comparing with 1,554 tons in 1909 and 1,490 tons last year.

The average wage increase per ton of steel produced, as stated by Dow, Jones & Co., has not been in sympathy with the movement of finished steel production per man. In 1902 the average wage per ton of steel sold was $14.70, and in the following year $16.40. Th low level was reached in 1905, when $13.80 was reported, and the highest in 1908, with $19.40. Last year the average was $16.30.

The following table gives the finished steel production "for sale" per man, based upon total employees of the corporation; finished steel production "for sale" per man, based upon employees in manufacturing departments only; average wage per man based upon each ton of steel produced "for sale"; iron-ore production per man, based upon number of employees in mines only; and average coal and coke production per man, based upon total number of men employed in coal and coke departments, from 1902 to 1910, inclusive:

Year.	Finished steel per man.	Manufacturing department only.	Wage per ton.	Ore produced per man.	Coal and coke produced per man.
1910	49	63	$16.30	786	1,490
1909	50	71	15.30	763	1,554
1908	38	52	19.40	651	1,268
1907	50	68	15.20	663	1,361
1906	52	72	14.00	693	1,434
1905	51	71	13.80	692	1,532
1904	46	61	14.80	680	1,239
1903	44	62	16.40	572	1,116
1902	49	65	14.70	592	1,193

It would require the most minute details of the operations of the Steel Corporation from the mining of iron ore to its conversion into pig iron, then into ingots, and lastly into finished steel, to arrive at a conclusion as to actual cost of finished products. It is evident, however, that a percentage of the saving resulting from concentration of operations, substitution of new and improved machinery for the more obsolete types, and the introduction of economies in general have been offset to a large extent by the upward tendency in wages.

WAGES AND EARNINGS.

To show the important part increased wages have taken in adding to the cost of producing steel it is necessary to go back to 1902, in which year the average wage per ton of steel sold was $14.70, as against $16.30 in 1910. Had the same average wage prevailed last year as in 1902, the mount the Steel Corporation would have had to pay out in wages in 1910 on a production of 10,733,995 tons of finished steel would have been $157,700,000, compared with the actual amount paid in 1910 of $174,955,000, a difference of more than $17,000,000. Should the Steel Corporation enter into a period of depression which threatened to be prolonged, or was forced to submit to a drastic revision of the steel tariff schedule, it could cut the wages of its employees 5 per cent and save more than $8,000,000 a year on a basis of wages paid in 1910. How-

ever, idle mills and furnaces would cause a reduction in the number of employees, which would lower the foregoing $8,000,000 saving proportionately. The policy of the Steel Corporation has been to maintain reasonable prices as well as reasonable wages, believing the result will be to preserve a better organization as well as improve the standard of labor. The corporation, it will be remembered, declined to follow the general movement toward lower wages after the panic of 1907. Only a year ago it granted substantial increases to its 225,000 employees.

The many plans in force for the general betterment of labor, the voluntary accident relief plan, old-age pensions for employees, the purpose of which is to provide an aggregate principal sum of $8,000,000, which, with the $4,000,000 fund of Andrew Carnegie, makes a total of $12,000,000; employees' stock subscription plan, elimination of Sunday work as far as possible, reduced hours, and the bonus system, which means a distribution of between $2,000,000 and $3,000,000 a year, have all tended toward closer and more harmonious relations between employer and employee. In this connection it is interesting to note that the United States Steel Corporation has experienced only one severe strike—that shortly after the organization of the company. Disputes over labor have been of minor importance. The tin-plate strike was not a matter of wages, but a question of policy.

CORPORATION'S SHAREHOLDERS' LIST.

The shareholders of the Steel Corporation now number close to 100,000, estimating the stock held abroad and in brokerage houses, the real owners of which are not holders of record. There are approximately 25,000 employees of the Steel Corporation who are stockholders of record, having purchased their shares under the terms of the profit-sharing plan. In other words, employees of the Steel Corporation itself are represented to the extent of close to 25 per cent of the total shareholders' list. That employees have reaped benefits running into millions of dollars through the profit-sharing plan is evident from the prices paid for these shares. The average price paid for the preferred in the nine years the plan has been in force was a little less than $96 a share, compared with the present market quotation of $120 a share. The lowest level at which employees obtained the preferred was $55 a share in 1904.

Common stock was purchased by the employees on a basis of $50 a share in 1909, and $70 in 1911, an average of $60 a share, compared with the present market price of $76. Appreciation in the shares amounts to many millions of dollars, to say nothing of dividends and bonuses.

Over 1,000,000 shares of common and 300,000 shares of preferred, representing approximately 15 per cent of the total capitalization, are held abroad.

The large list of shareholders the Steel Corporation has built up in a period of 10 years is not attributed so much to the heavy capitalization as to the open policy in making public all the information necessary to enlighten shareholders as to operations and other developments bearing upon the affairs of the company. Chairman Gary inaugurated such a plan at the beginning. He encountered considerable opposition on the part of certain interests who adhered to the belief that corporations should confine their statements to the barest details. The corporation's publicity plan has been widened in scope year by year, and shareholders are in a position to obtain all the information necessary to keep them posted as to the course of the company's business and operations in general. The more recent step toward wider publicity was the adoption and execution of the plan making public monthly unfilled orders on the books. The result has been that shareholders as well as the public in general are being kept informed not only of the drift of the business of the United States Steel Corporation but the steel industry in general.

The corporation's desire to keep its shareholders posted on current developments has influenced a great change in the methods of many other corporations. Over the last 10 years annual statements that are of some service to the shareholders have become more numerous. It is to be noted that the shareholders' lists of the corporations that have adopted a wider policy of publicity show much greater gains than the corporations that still adhere to abbreviated reports or statements.

OPERATING COSTS AND GROSS BUSINESS.

The Steel Corporation's operating ratio to gross business over the last 10 years has been uniform, notwithstanding additional expenses in the way of increased wages, etc. This would seem to indicate that expansion in costs in one direction has been offset by higher operating efficiency in general. No better proof of skilled and well-directed management could be obtained.

The Steel Corporation's ratio of operating costs to gross in 1902 was 73.4 per cent, the lowest on record, compared with 75 per cent last year, or about 0.4 per cent below the average for the years 1902 to 1910, inclusive. In 1907 the ratio of manufacturing costs to gross was about 0.5 per cent below 1910. Provisional charges for depreciation are eliminated from costs in the foregoing calculations, but ordinary repairs are included.

Eliminating ordinary maintenance and repairs as well as depreciation allowances from manufacturing and producing costs brings about a much lower operating ratio to gross business. In 1910, on this basis, the ratio would have been approximately 69 per cent, comparing with 71 per cent in 1909, 70 per cent in 1907, 76 per cent in 1904, and 70 per cent in 1902.

The per cent of total net earnings to gross sales shows no marked variation in the last six years, but the 1910 figure is about 3¼ per cent below that of 1902. The ratio of net earnings per gross sales last year was 20.04 per cent, compared with 23.75 per cent in 1902. The low level reached was 16.47 per cent in 1904, although the depressed year of 1908 showed an improvement over the former year, with 19.04 per cent.

The following table gives the ratio of total net earnings of the Steel Corporation to gross business from 1902 to 1910, inclusive:

Year.	Net earnings.	Net to gross.
		P. ct.
1910	$141,054,754	20.04
1909	131,491,414	20.34
1908	91,847,710	19.04
1907	160,964,673	21.26
1906	156,624,273	22.43
1905	119,787,658	20.46
1904	79,176,522	16.47
1903	109,171,152	20.35
1902	133,308,764	23.78

The gross business of the Steel Corporation includes revenues from all subsidiary concerns. The amount represents the aggregate gross value of commercial transactions conducted by the respective companies, and includes sales made between subsidiary companies, and the gross receipts of the transportation companies for services rendered both to subsidiary companies and to the public. The earnings resulting from gross business represent the combined profits accruing to the several corporate interests on the respective sales and services rendered, each of which in itself is a complete commercial transaction. As a result, gross business does not by any means represent the prices received from tonnage of finished steel sold. Elimination of all sources of income except receipts from finished steel alone would reduce the gross business materially. But with its vast transportation system, cement plants, and hundreds of millions of dollars invested in works that handle the ore from the time it is taken from the ground until its conversion into finished steel, it would seem that any other way of computing gross business would be deceptive. With the many sources of income at its command, including earnings from transportation, cement sales, income from money loaned, blast furnaces and other works that handle the ore up to the time it is shaped into an ingot ready for the finishing mills, there is nothing mysterious in the average ratio of $14 per ton of steel sold over the last 10 years.

On a basis of prices received for 10,733,995 tons of steel sold in 1910, the Steel Corporation probably received less than $400,000,000, although its gross business was reported as nearly $704,000,000. The percentage of profits must be reckoned against this total gross business rather than its gross sales of total finished products, for within this finished product it has saved its shareholders not only the steel manufacturer's profit, but the ore miner's profit,

the coal miner's profit, transportation profit, etc. These and other contributing factors are responsible for the heavy gross receipts compared with average steel prices.

RATIO OF GROSS PER TON.

United States Steel's ratio of gross earnings per ton of steel sold shows quite a drop over the last several years. For example, the ratio last year was $65.59, compared with $65.55 in 1909, $77.70 in 1908, and $72.95 in 1907. In 1902 the ratio of gross business per ton of steel sold was $68.37. The annual gross business of the United States Steel Corporation exceeds the combined gross of its six largest competitors in this country four times over.

The Steel Corporation seems to have ample working capital to take care of the business it has been doing over the last few years. An evidence of this is found in the fact that it maintains at all times a cash balance running between $50,000,000 and $65,000,000 and is always a lender of money. A good percentage of its surplus has been utilized for the purpose of building up liquid assets. In 1901, for example, the corporation reported excess current assets over current liabilities of approximately $165,000,000. On December 31 last the excess was $236,000,000, a gain within that period of more than $70,000,000.

Inventories have absorbed a large per cent of the increase in working capital. As an illustration, inventories on December 31 last were valued at $176,000,000, compared with approximately $105,000,000 on December 31, 1902. Naturally, the heavy increase in the business of the corporation necessitates larger stocks of ore, finished steel, etc.

The total inventory valuations of the United States Steel Corporation from 1902 to 1910, inclusive, together with the value of the two largest items in the classification, namely, iron ore and finished steel, follow:

	Total inventories.	Iron ore.	Finished steel.
1910	$176,537,824	$80,345,434	$31,913,767
1909	163,811,280	67,692,137	26,776,337
1908	143,179,629	65,783,299	25,999,591
1907	136,188,874	58,984,718	24,868,713
1906	119,897,467	42,330,919	21,626,657
1905	113,387,997	38,877,141	24,140,746
1904	94,812,546	30,205,977	21,016,539
1903	107,976,523	42,018,988	21,564,596
1902	104,390,844	34,072,039	18,968,396

With a capacity almost double what it was 10 years ago, there is nothing strange in the pronounced increase in inventory valuations.

Few people realize the extent of the Steel Corporation's mineral wealth outside of iron ore. Its acreage of coal, coke, and natural gas property represents a stupendous investment in itself. It either owns outright or leases the following coking and steam coal property:

	Acres.
Total northern coal	234,938
Total southern coal	347,637
Total	582,575

The Carnegie Natural Gas Co. has in Pennsylvania and West Virginia extensive natural gas territory, either owning or having under lease 197,161 acres. It owns 600 miles of pipe lines, 6 pumping stations, and 388 active wells, The American Sheet & Tin Plate Co. has under lease 32,360 acres of gas territory, with 147 active wells. The National Tube Co. has under lease about 10,691 acres of gas territory and 5 developed wells.

At time of organization the corporation owned or had under lease less than 170,000 acres of steam and coking coal properties.

On December 31 last the corporation also had 74 coke plants, 23,008 beehive ovens, 612 by-product ovens, and 30 coal plants not connected with coke plants.

VAST SYSTEM OF RAILROADS.

The railroad mileage operated by the Steel Corporation exceeds that of many of the leading railroad companies. For example, the Steel Corporation on December 31 last was operating 2,036 miles of main line, 350 miles of second track, and 921 miles of yards and sidings, a total of 3,307 miles. The mileage operated by the Steel Corporation is double that of the Reading and as large as that of the Norfolk & Western. The Lake Shore operates only 700 miles more than the Steel Corporation.

During the navigation season the Steel Corporation receives its heaviest earnings from its transportation lines. This accounts for the larger earnings of the second and third quarters as compared with the first and last quarters of the year.

The Steel Corporation's mileage and equipment has been growing since its organization. For example, in 1902 it had a total of 471 locomotives, comparing with 1,168 last year. Freight and passenger cars owned in 1902 aggregated 26,164, comparing with 47,025 in 1910. The foregoing embraces only standard gauge railroad equipment. In addition, the Steel Corporation has 203 steamers and barges.

The following table, published by the Wall Street Journal, shows the mileage operated by the Steel Corporation compared with that operated by 17 important railroad companies:

	Main line, miles operated.	Second, third, and fourth track.	Yards and sidings.	Total.
Boston & Maine	2,290	564	1,317	4,171
Central of Georgia	1,912	6	557	2,475
Central of New Jersey	669	334	620	1,623
Chesapeake & Ohio	1,964	438	780	3,182
Chicago & Alton	998	146	357	1,501
Delaware, Lackawanna & Western	956	512	1,031	2,499
Denver & Rio Grande	2,598	100	565	3,263
Lake Shore	1,663	1,151	1,167	3,981
Lehigh Valley	1,433	687	1,141	3,261
Long Island	395	180	219	794
Missouri, Kansas & Texas	3,072	.....	787	3,859
New York, Ontario & Western	493	128	226	847
Norfolk & Western	1,950	349	996	3,295
Reading	646	371	487	1,504
Texas & Pacific	1,885	49	559	2,493
Wabash	2,515	110	801	3,426
Wheeling & Lake Erie	513	9	332	854
United States Steel's railroads	2,036	350	921	3,307

The following tables give the railroad and steamship make-up of the United States Steel Corporation over a series of years:

	1910	1909	1908	1907	1906	1905
Railroad mileage:						
Main line owned	948	898	873	853	852	814
Branches and spurs	711	557	575	492	394	350
Operated under track routes	377	458	435	410	391	297
Second track	350	322	304	298	271	215
Sidings	921	824	754	659	613	541
Total miles operated	3,307	3,059	2,941	2,712	2,521	2,217
Marine equipment:						
Steamers	81	77	76	76	72	70
Barges	122	112	29	29	29	30
Total	[1] 203	189	105	105	101	100
Miscellaneous cars owned:						
Delaware & Lackawanna R. R.	5,934	5,413	5,247	5,446	4,892	4,501
Duluth, Missabe & Northern Ry	8,052	7,209	7,279	7,347	5,519	4,665
Elgin, Joliet & Eastern Ry	2,970	3,155	3,287	3,388	3,040	2,588
Chicago, Lake Shore & Eastern Ry	8,947	8,984	9,129	8,024	5,741	5,179
Bessemer & Lake Erie R. R.	9,826	9,999	8,885	9,596	8,805	8,933
Union Ry	5,038	4,033	4,038	2,633	1,233	1,126
All other railways	1,614	1,626	1,160	1,249	1,092	1,048
Iron-mining companies	2,216	2,205	2,014	1,850	1,063	295
Steel, coal, and coke companies	1,498	1,770	2,887	3,210	3,206	3,400
Birmingham Southern	930	831	721	.....	.....	.....
Total	47,025	45,225	45,682	42,745	34,591	31,735
Locomotives owned	1,168	1,024	960	908	768	690

[1] Includes 70 wooden barges.

The growth of the Steel Corporation's transportation system has been as rapid as that of steel production. The corporation, in fact, has about twice the capacity for handling freight it had 10 years ago.

GARY DICTATES POLICY.

The affairs of the United States Steel Corporation are dominated by its chairman, E. H. Gary. The by-laws give him absolute control over all departments and officers. In the absence of the chairman, the president is in charge. Judge Gary is at the head of the board of directors as well as the finance committee. The board of directors holds monthly meetings and the finance committee convenes once a week. The heads of the subsidiary companies hold monthly meetings, but are subject to calls for special conferences at any time.

The trend of the steel industry last year was erratic. The various companies enjoyed a fair business up until the last quarter, when there was a sharp slump in incoming business, followed by reduced operations. At the close of the year the furnaces of United States Steel were operating not much more than 47 per cent of maximum capacity. A revival started in about the middle of January, which carried blast-furnace operations of United States Steel up to 72 per cent of capacity. Since then there has been a reaction to 65 per cent at this writing. The incoming new business of the corporation in the month of January amounted to 35,000 tons a day, in February close to 41,000 tons a day, in March between 35,000 and 36,000 tons a day, and in April 25,000 tons a day. The amount of new business in the first quarter of the year if continued would indicate a production of finished steel "for sale" in 1911 of something less than 10,000,000 tons, compared with actual production last year of 10,734,000 tons. This would enable the corporation to make a good showing in earnings this year, but a great deal of business is being held back pending the Supreme Court decisions in the Standard Oil and Tobacco cases and uncertainty as to just what Congress proposes to do in the matter of revising steel duties. It is altogether likely that the rulings of the Interstate Commerce Commission in the freight-rate cases had a great deal to do with the failure of railroads to enter the market for equipment on a larger scale, but for the last year or more the railroads have become less of a factor in the steel trade, or, rather, their per-

centage of steel tonnage consumed to the total has been considerably less than in the past. As an example, the new orders received by United States Steel from the railroads since January 1 represent less than 10 per cent of the corporation's total. That this is out of all proportion to normal is evident when it is considered that the railroads have been credited with consuming close to 25 per cent of all the steel turned out by the United States.

The Steel Corporation can credit its increased operations in the first quarter of this year to demand for the lighter grades of steel and steel for export. Had it not been for the better showing in tin plate, wire, etc., the first quarter of 1911 would have recorded a very small volume of new business as well as an even sharper falling off in earnings, compared with the first quarter of last year.

RAILROADS AND STEEL.

That the steel companies for the last several years have been laboring under the belief that the railroads would continue to show a heavy increase in consumption is evident from the preparations made for increasing the output of steel rails. Four or five years ago the steel mills of the country had a rail capacity of between 3,500,000 and 4,000,000 tons a year. To-day the rail capacity of the country is slightly in excess of 6,000,000 tons. In no year have the country's railroads called for more than 4,000,000 tons. It would seem that, with a capacity of 6,000,000 tons, at least one-third of the rail mills of the country stand to remain idle until the railroads begin to increase their consumption above past requirements. Renewals alone should guarantee the rail mills a production averaging more than 3,000,000 tons a year, as there are in use in this country to-day, according to recent estimates, between 45,000,000 and 50,000,000 tons.

United States Steel was justly criticized at time of organization for the absorption of certain subsidiary companies at prices far beyond intrinsic valuation. Certain interests were in doubt as to the ability of the corporation to maintain permanently even the dividend of 7 per cent on the preferred stock. The policy of the management has been to eliminate the water that was injected into the property at organization. Dividends of 4 per cent a year on the common for a short period after organization were not justified, and warranted criticism. After 1904 the Steel Corporation, with much larger earnings, could have resumed dividends at the old rate, but refrained from doing so, as the program was for expenditures from earnings for new construction. In 1909 the management concluded that sufficient money had gone back into the property to assure much larger earnings and therefore a better return on the common stock. At the time the corporation placed the common stock on a 5 per cent basis the claim was made that with expenditures of $50,000,000 a year for new construction such a high rate could not be continued. The explanation was that, if necessary, bonds would be issued in depressed periods to cover expenditures for new construction, but with a much larger earning power it was believed few new securities would have to be issued for construction purposes. The capacity of the Steel Corporation has reached such a high level as to warrant a less aggressive campaign for new construction. Chairman Gary says that close to $50,000,000 will be spent for new construction this year, a large amount of which will be used at Gary. This year should wind up, for several years at least, excessive outlays for new construction, which have averaged close to $50,000,000 a year since 1904. As the independent companies have kept pace with the Steel Corporation in the matter of new construction work, it is probable the steel industry in general will soon begin to cut down expenditures for new plants, acquisitions, etc.

FIRST QUARTER OF 1911.

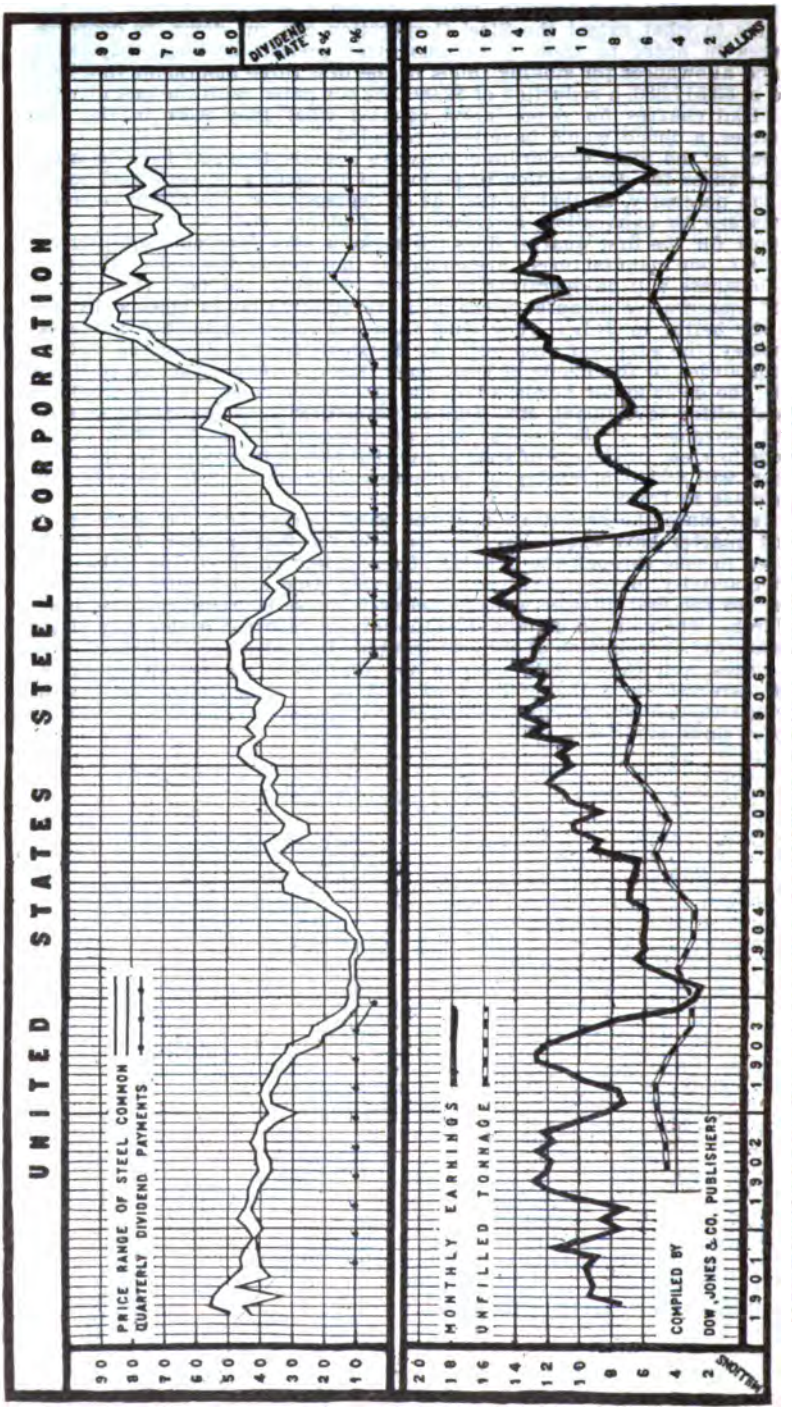
The report of the United States Steel Corporation for the first quarter of the current year showed total net earnings of $23,519,203, making the aggregate net earnings from time of organization, April 1, 1901, to April 1, 1911, the full 10-year period, $1,225,733,718. For the full 10-year period dividend payments by the Steel Corporation aggregate a total of $406,621,584, and interest payments on United States Steel bonds, not including subsidiary company bonds, $214,608,919, making total interest and dividend payments for the decade, $621,230,503.

The report for the first quarter, which showed a surplus of only $31,155, demonstrates to what extent the Steel Corporation can cut down its depreciation charges in order to show a surplus after present dividend payments. Charges and allowances for sinking funds in the first three months of this year amounted to $3,517,386, a reduction of $2,001,132 compared with the last quarter of 1910. Had charges for depreciation equaled what they were in the preceding quarter, a deficit would have been revealed.

The policy of the Steel Corporation since its organization has been to make liberal allowances for depreciation in periods of prosperity, charging off more, in fact, than necessary, so that in periods of depression it can afford to make smaller charges for exhaustion, deterioration of plants, etc.

The report for the first quarter does not make a very favorable opening for the year 1911, but manufacturers are confident that before the end of the year the steel business will be operating to normal capacity. In fact, there are a number of conservative manufacturers who are building hopes upon a decided turn for the better in July. They base their contention upon the universal ease of money, the excellent crop outlook, the small stocks of steel as well as other commodities in the hands of consumers, the quickening pace of business in Europe, the demand for bonds, the large amount of money in the hands of investors awaiting investment, etc. One manufacturer says the stocks of steel carried by consumers at the present time are the smallest in 10 years. With heavy crops in view, producers of steel argue that the railroads, before the close of the year, will find it necessary to purchase equipment in order to take care of the increase in traffic.

Every year since the organization of the Steel Corporation net earnings in the second quarter have shown an increase over the first quarter, due largely to increased income through the opening of navigation on the Great Lakes and the greater activity of transportation in general. One satisfactory feature of the report for the first quarter was the heavy increase in earnings from January to March. The gain, in dollars, was the largest reported within any single quarter since the organization of the corporation. But with prospective changes in steel duties, and the country's crops not absolutely assured, it would be difficult to forecast the course of the steel industry over the remaining months of the year, although manufacturers express confidence in a recovery within the next two or three months.



The heavy vertical lines in the above charts are *year* dividens, and the finer vertical lines monthly dividens. The horizontal heavy lines in the upper chart indicate two-point range, and two-point range in the lower chart. In the upper chart the heavy parallel lines show the range of price of Steel common from the date of interposition of the company up to the end of March, being plotted from the monthly high and low figures. In the upper chart the black line with dots is the quarterly dividend payments expressed in percentages. The initial payment was 1% quarterly in September, 1901. The break in the line indicates that no dividends were paid from December, 1903, until the latter part of 1904, when they were again resumed at the rate of 1%. In March, 1910, the regular quarterly dividend of 1% and ¾ of 1% extra were paid. This is shown by the abrupt rise in the dividend line. In the upper chart the figures on the side are in dollars, except for the quarterly dividend rate which is shown on the right. In the lower chart the figures are in millions, the heavy black line being the monthly earnings in millions of dollars and the dotted line the unfilled business in millions of tons.

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STATISTICAL STORY WITH ANALYSIS.

Comparative operations, progress and accomplishments, gross business and operating costs, total dividends and interest payments, balance available for dividends on common stock, charges against surplus, sinking funds, depreciation, etc.

Fiscal year ending December 31.	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901 (9 months).	Totals Apr. 1, 1901 to Dec. 31, 1910.
Gross receipts [1]	$703,961,424	$646,382,251	$482,307,840	$757,014,767	$696,756,926	$585,331,736	$444,405,430	$536,572,871	$560,510,479	[2] $400,000,000	$5,813,243,724
Manufacturing and operating expenses [3]	529,215,790	483,417,843	367,735,103	564,166,777	517,083,955	440,013,433	353,627,315	409,248,599	411,408,818	.....	.....
Balance	174,745,634	162,964,408	114,572,737	192,847,990	179,672,071	145,318,303	90,778,115	127,304,272	149,101,661	.....	.....
Per cent manufacturing costs to gross	75.0	74.8	76.0	74.5	74.2	75.2	79.5	76.3	73.4	.....	[4] 75.4
Manufacturing gains or losses, adjustments, etc	2,728,348	3,385,382	1,488,805	3,266,210	3,790,920	2,758,634	796,838	1,720,043	3,128,970	.....	.....
Total net manufacturing and producing income	177,473,982	166,349,790	116,061,542	196,114,200	183,463,891	148,076,937	91,574,953	129,024,315	152,230,631	.....	.....
Other income	3,124,820	3,342,617	4,298,080	6,482,740	5,368,943	3,298,500	2,960,111	3,548,550	5,426,452	.....	.....
Total income	180,598,802	169,782,407	120,359,622	202,596,940	188,832,834	151,375,437	94,535,064	132,572,865	157,657,083	.....	.....
General expenses	29,863,055	27,786,420	21,001,037	25,395,379	22,907,679	18,570,374	14,785,396	16,847,852	17,501,892	.....	.....
Balance	150,735,747	141,995,987	99,358,585	177,201,561	165,925,155	132,805,063	79,749,668	115,725,013	140,155,191	.....	.....
Interest charges, etc., subsidiary companies	7,263,453	7,887,179	7,401,205	6,492,195	6,561,478	6,710,215	6,573,146	6,553,861	6,846,427	.....	.....
Balance	143,472,294	134,108,808	91,957,380	170,709,366	159,363,676	126,094,849	73,176,522	109,171,152	133,308,764	.....	.....
Less profits subsidiary companies	2,417,540	2,617,395	109,670	9,744,693	2,739,403	6,307,190	.....	.....	.....	.....	.....
Total net earnings	141,054,754	131,491,413	91,847,710	160,964,673	156,624,273	119,787,658	73,176,522	109,171,152	133,308,764	84,787,596	1,202,214,515
Per cent total net earnings to gross	20.0	20.3	19.0	21.2	22.4	20.4	16.4	20.3	23.7	.....	[4] 20.4

[1] Gross receipts do not represent merely the money received by the Steel Corporation for steel sold. On a basis of prices received for 10,732,995 tons of steel sold in 1910, the corporation probably received less than $400,000,000, although its gross receipts were reported as nearly $704,000,000. The percentage of profits must be reckoned against its total gross business rather than against its gross sales of total finished product, for within this finished product it has saved for its shareholders not only the steel manufacturer's profit, but the ore miner's profit, the coal miner's profit, the transportation profit, etc. These and other contributing factors are responsible for the heavy gross receipts compared with average steel prices.

[2] Estimated.

[3] Include ordinary repairs but not provisional charges for depreciation.

[4] Average per year.

STATISTICAL STORY WITH ANALYSIS—Continued.

Comparative operations, progress and accomplishments, gross business and operating costs, total dividends and interest payments, balance available for dividends on common stock, charges against surplus, sinking funds, depreciation, etc.—Continued.

Fiscal year ending December 31.	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901 (9 months).	Totals Apr. 1, 1901 to Dec. 31, 1910.
DEDUCTIONS FROM TOTAL NET EARNINGS.											
Depreciation and replacement funds	$22,140,555	$21,994,054	$15,377,111	$25,741,983	$28,753,270	$21,665,062	$12,574,211	$23,897,353	$24,150,325	[4] $9,695,702	$205,989,626
Various accounts charged off	83,122	548,445	94,034	681,515	90,501	99,254	1,183,372	5,378,837	.....	828,494	7,702,616
Interest on United States Steel bonds	23,366,760	23,617,293	23,862,647	22,860,353	22,839,850	23,056,437	23,518,293	19,082,796	15,187,850	11,400,000	208,792,279
Total	45,590,437	45,062,902	39,145,724	49,283,851	51,683,621	44,820,753	37,275,876	48,358,986	39,338,175	21,924,196	422,484,521
SINKING FUNDS.											
Bonds of subsidiary companies	2,176,041	1,724,260	1,568,070	1,977,761	1,904,063	1,699,999	1,563,117	1,596,012	624,064	624,064	15,489,451
Bonds of United States Steel Corporation	4,050,000	4,050,000	4,050,000	4,050,000	4,050,000	4,050,000	4,050,000	3,797,500	3,040,000	1,639,228	36,826,728
Interest on bonds in sinking funds	1,831,089	1,580,556	1,335,203	1,087,497	858,000	641,413	.....	.....	.....	.....	7,333,758
Total	8,057,130	7,354,816	6,973,273	7,115,258	6,812,063	6,381,412	5,633,117	5,395,512	3,664,064	2,263,292	59,649,937
Surplus for dividends	87,407,187	79,073,695	45,728,713	104,565,564	98,128,589	68,585,493	30,267,529	55,416,654	90,306,525	60,600,108	720,080,057
DIVIDENDS.											
Preferred stock	25,219,677	25,219,677	25,219,677	25,219,677	25,219,677	25,219,677	25,219,677	30,404,173	35,720,177	26,752,894	269,414,983
Common stock	25,415,125	20,332,100	10,166,050	10,166,050	10,166,050	.....	.....	12,707,562	20,332,690	15,226,274	124,511,901
Total	50,634,802	45,551,777	35,385,727	35,385,727	35,385,727	25,219,677	25,219,677	43,111,735	56,052,867	41,979,168	393,926,884
Per cent balance surplus to preferred [1]	24.3	21.9	12.7	29.0	27.2	19.0	8.4	15.3	25.0	16.8	[3] 20.5
Per cent balance surplus available for common [1]	12.2	10.6	4.0	15.6	14.3	8.5	1.0	5.0	10.7	6.6	[3] 9
Total deductions from total net earnings	104,282,369	97,969,495	81,504,724	91,784,836	93,881,411	76,421,842	68,128,670	96,866,233	99,055,106	66,166,656	876,061,342
Surplus	36,772,385	33,521,918	10,342,986	69,179,837	62,742,862	43,365,816	5,047,852	12,304,919	34,253,658	18,620,940	326,153,173
Previous surplus	151,354,534	133,415,220	122,645,251	97,720,722	84,738,457	61,365,452	66,096,687	77,874,598	43,620,940	25,000,000	25,000,000
Total surplus	188,126,919	166,937,138	132,988,237	166,900,559	147,481,319	104,731,268	71,144,539	90,179,517	77,874,598	43,620,940	351,153,173

DISPOSITION OF SURPLUS.											
Settlement commitments subsidiary companies, adjustments, etc	401,294		[2] 317,314				8,524,751	[4] 24,082,830			32,691,501
Appropriations for construction, etc	15,000,000	10,000,000		35,500,000	28,500,000	16,300,000					105,300,000
Appropriations for plants and properties at Gary	10,000,000	5,000,000		18,500,000	21,500,000	10,000,000					65,000,000
Appropriations for mining royalties	1,000,000	3,200,000			2,500,000						6,700,000
Total appropriations, adjustments, etc	26,401,294	18,200,000	[2] 317,314	54,000,000	52,500,000	26,300,000	8,524,751	24,082,830			209,691,561
Increase in surplus of subsidiary companies	2,417,541	2,617,396	109,669	9,744,692	2,739,403	6,307,189	[5] 1,254,336				22,681,554
Final deductions from "total surplus" above	23,983,753	15,582,604	[3] 426,983	44,255,308	49,760,597	19,992,811	9,779,087	24,082,830			187,010,007
Net surplus	164,143,166	151,354,534	[1] 33,415,220	122,645,251	97,720,722	84,738,457	61,365,452	66,096,687	77,874,598	43,620,940	164,143,166

[1] Based upon present capitalization.
[2] Average per year.
[3] Increase.
[4] Includes $6,800,000, expense of conversion of preferred stock into bonds and sale of 10-60 year bonds, and $17,234,128 charged off Dec. 31, 1903, for expenditures made for construction, payment of capital obligations, etc.
[5] Decrease.

STATISTICAL STUDY OF PRODUCTION, ETC.

[Earning power shows heavy gain since organization. Wages on the increase. Total preferred dividend and interest payments show decrease. Lower steel prices responsible for the smaller ratio of earnings per ton of steel produced.]

	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	Totals.
Expended for ordinary repairs	$41,000,000	$35,000,000	$27,000,000	$35,000,000	$29,000,000	$24,000,000	$18,000,000	$22,000,000	$21,000,000	$14,000,000	$266,000,000
Expended for new construction	53,101,221	[1] 53,853,179	49,422,697	66,981,252	32,155,145	24,395,408	17,957,940	31,042,135	16,586,531	16,956,868	3[illegible]2,452,383
Spent for extraordinary replacements	8,489,285	8,514,716	10,729,603	20,324,584	17,839,161	13,495,140	8,102,873	12,939,777	7,926,792	[2] 5,000,000	113,351,931
Total United States Steel bonds	465,189,500	470,260,500	475,266,500	480,199,000	455,000,500	459,406,000	463,798,000	451,221,500	301,059,000	303,757,000	.....
Total subsidiary bonds	131,130,661	136,089,252	117,930,342	119,951,904	107,120,680	108,452,690	107,954,668	99,779,177	59,654,900	60,978,900	.....
Total preferred stock	360,281,100	360,281,100	360,281,100	360,281,100	360,281,100	360,281,100	360,281,100	360,281,100	510,281,100	510,281,100	.....
Total common stock	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	508,302,500	.....
Total capital stock and bonded debt	1,464,903,761	1,474,933,352	1,461,780,442	1,468,734,504	1,430,704,780	1,436,441,290	1,440,336,266	1,419,584,277	1,379,297,500	1,383,309,500	.....
Property account	1,430,212,860	1,500,092,134	1,474,142,654	1,445,837,450	1,383,907,945	1,380,031,032	1,373,967,045	1,357,394,468	1,325,2[illegible]7,583	.....	.....
Total assets	1,745,724,284	1,821,965,555	1,746,017,531	1,758,113,013	1,681,309,769	1,637,811,257	1,591,014,067	1,583,845,298	1,54[illegible],544,234	.....	.....
Current assets	288,742,419	291,018,166	239,226,176	274,411,308	266,567,925	232,6[illegible]48,020	202,608,740	215,610,889	214,834,157	.....	.....
Sinking and reserve fund assets	16,067,905	21,738,953	23,2[illegible]3,034	32,442,401	27,443,944	16,736,553	6,958,448	5,522,546	2,804,488	.....	.....
Current liabilities	52,834,787	61,144,725	43,031,853	45,063,824	43,672,009	40,767,558	39,848,354	39,540,[illegible]39	49,82[illegible],251	.....	.....
Excess current assets	251,965,537	251,612,394	219,453,358	261,789,885	250,339,840	208,617,515	169,728,934	181,592,796	167,812,394	.....	.....
Excess current assets, not including sinking and reserve funds	235,907,632	229,873,441	196,190,323	229,347,484	222,895,896	191,881,062	162,760,386	176,070,250	165,007,900	.....	[3] 70,899,726
Interest paid on subsidiary bonds	7,124,072	7,728,822	7,189,491	6,368,163	6,391,042	6,382,080	6,211,313	5,756,488	3,879,439	.....	57,030,810
Interest on bills payable, mortgages, etc	139,380	158,355	211,713	124,031	170,435	328,134	361,832	797,373	2,234,144	.....	4,525,397
Preferred dividend, interest and mortgage obligations	55,849,888	56,724,147	56,483,528	54,572,224	54,620,994	54,986,328	55,311,115	56,080,830	57,754,454	.....	.....
Total earnings per ton steel sold	13.14	13.34	14.80	15.24	14.80	13.50	10.80	14.30	16.25	.....	.....
Net earnings per ton steel sold	10.97	10.93	12.06	12.61	12.00	10.45	8.70	11.20	13.25	.....	.....
Earning capacity on basis of $14 per ton capacity	$192,500,000	.....	.....	.....	.....	.....	.....	.....	.....	$108,100,000	.....
Blast furnace capacity (tons)	16,000,000	.....	.....	.....	.....	.....	.....	.....	.....	7,440,000	.....
Steel ingot capacity (tons)	18,000,000	.....	.....	.....	.....	.....	.....	.....	.....	9,425,000	.....
Steel products for sale, capacity (tons)	13,750,000	.....	.....	.....	.....	.....	.....	.....	.....	7,719,000	.....
Cement capacity (barrels)	8,000,000	.....	.....	.....	.....	.....	.....	.....	.....	500,000	.....
Per cent pig iron production to country's total	44.5	45.1	43.5	44.3	44.5	44.2	44.7	40.4	44.7	43.2	.....

Per cent steel ingot production to country's total	54.3	55.9	56.4	57.1	57.7	59.9	60.6	63.1	65.2	66.2	.....
Cash holdings	$56,953,514	$58,521,113	$49,548,053	$53,963,848	$67,636,808	$58,955,914	$60,646,420	$63,022,560	$50,163,172	.....	.....
Unexpended balance to credit of depreciation funds, etc	65,802,824	53,828,283	42,546,313	41,360,655	38,665,499	29,651,000	22,463,164	20,584,291	20,264,000	.....	.....
Undivided surplus	164,143,157	151,354,527	133,415,000	122,646,000	97,721,000	84,738,000	61,365,000	66,097,000	77,875,000	.....	.....
Prices at which preferred stock was sold to employees	124	110	87.50	102	100	87.50	55	82.50	.....	.....	[4] 114
Preferred shares taken by employees	24,672	18,000	25,000	27,032	23,989	17,973	32,516	48,983	.....	.....	[4] 19,229
Price at which common stock was sold to employees	.....	$50	.....	.....	.....	.....	.....	.....	.....	.....	[4] $70
Common stock taken by employees	.....	15,318	.....	.....	.....	.....	.....	.....	.....	.....	[4] 29,119
Number shareholders	[2] 100,000	[2] 100,000	[2] 95,000	[2] 84,000	[2] 80,000	[2] 70,000	67,522	79,957	43,109	.....	.....
Pig-iron production (tons)	11,831,398	11,618,350	6,934,408	11,422,795	11,267,377	10,172,148	7,369,421	7,279,241	7,975,530	.....	85,870,668
Coke manufactured (tons)	13,649,578	13,590,112	8,169,931	13,544,764	13,295,075	12,242,909	8,652,293	8,658,391	9,521,567	.....	101,334,620
Coal mined (tons)	4,850,111	3,089,021	3,008,810	3,550,510	1,912,444	2,204,950	1,998,000	1,120,733	709,307	.....	22,443,946
Iron ore mined (tons)	25,245,816	23,431,047	16,662,715	23,980,558	20,645,148	18,486,556	10,803,087	15,363,355	16,063,179	.....	170,681,461
Bessemer ingot production (tons)	5,796,223	5,846,300	4,055,275	7,556,460	8,072,655	7,379,188	5,427,979	6,191,660	6,759,210	.....	57,084,950
Open-hearth ingot production (tons)	8,383,146	7,508,889	3,783,438	5,786,532	5,438,494	4,616,051	2,978,399	2,976,300	2,984,708	.....	44,455,957
Total steel ingot production (tons)	14,179,369	13,355,189	7,838,713	13,342,992	13,511,149	11,995,239	8,406,378	9,167,960	9,743,918	.....	101,540,907
Finished steel products for sale (tons)	10,733,995	9,859,660	6,206,932	10,564,537	10,578,433	9,226,386	6,792,780	7,458,879	8,197,232	[2] 6,000,000	85,618,834
Steel rails (tons)	2,118,473	1,719,486	1,050,389	1,879,985	1,982,042	1,727,055	1,242,646	1,934,315	1,920,786	.....	15,575,177
Structural shapes (tons)	653,797	614,971	587,954	313,733	620,823	484,048	313,779	362,705	481,029	.....	4,435,899
Wire (tons)	1,490,318	1,607,689	1,275,785	1,481,228	1,399,717	1,283,943	1,226,610	1,126,605	1,122,809	.....	12,014,702
Tubing and pipe (tons)	838,550	1,013,071	654,428	1,174,629	1,025,913	918,346	710,765	710,555	744,052	.....	7,813,319
Sheets and tin plate (tons)	1,082,787	1,024,985	770,321	1,070,752	1,112,542	924,439	735,482	763,670	783,570	.....	8,208,554
Cement production (barrels)	7,001,500	5,786,000	4,535,300	2,129,700	2,076,000	1,735,343	539,951	644,286	486,357	.....	24,934,437
Number of blast furnaces	127	127	123	116	97	93	91	86	84	.....	.....
Railroad mileage operated	3,305	3,059	2,941	2,712	2,521	2,217	2,007	1,892	1,814	.....	.....
Number of open-hearth furnaces	256	254	230	194	180	161	160	141	130	.....	.....
Number of Bessemer converters	35	35	35	37	37	37	36	38	35	.....	.....
Marine equipment (steamers and barges)	[5] 206	[5] 191	105	105	101	100	112	112	114	.....	.....
Cars owned	47,025	45,225	45,682	42,745	34,591	31,735	27,481	28,399	26,164	.....	.....
Locomotives owned	1,108	1,024	930	908	708	690	593	548	471	.....	.....
Iron ore in sight (tons)	[6] 1,400,000,000	.....	.....	.....	.....	.....	.....	.....	.....	[7] 700,000,000	.....
Wages paid	$174,955,139	$151,663,394	$120,570,829	$160,825,822	$147,765,540	$128,052,955	$99,778,276	$120,763,891	$120,528,343	[2] $90,000,000	$1,314,904,189

[1] Includes $15,936,929 stripping overburden from ore bodies preliminary to mining.
[2] Approximated.
[3] Increase in working capital from Dec. 31, 1902, to Dec. 31, 1910.
[4] Subscriptions for year 1911.
[5] Includes marine equipment on Ohio River.
[6] Includes 300,000,000 estimated tons in Hill ore lease, but not Southern ore holdings of Tennessee Coal & Iron Co., estimated at 700,000,000 tons.
[7] Estimate at time of organization.

STATISTICAL STUDY OF PRODUCTION, ETC.—Continued.

	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	Totals.
Annual wage per man, average	$800	$776	$729	$765	$729	$711	$677	$720	$717	.....	.....
Average wage per ton of finished product	16.3	15.3	19.4	15.2	14.0	13.8	14.8	16.4	14.7	.....	.....
Number of employees	218,435	195,500	165,211	210,180	202,457	180,158	147,343	167,709	168,127	.....	.....
Unfilled tonnage	2,674,757	5,927,031	3,603,527	4,642,553	8,489,718	7,605,106	4,693,203	3,215,120	5,347,520	.....	[1] $3,447,301
Exports of steel (tons)[2]	1,223,496	1,009,746	799,406	1,014,082	1,079,319	953,858	1,021,672	.....	.....	.....	.....
Gross business per ton steel sold	$65.59	$65.55	$77.70	$72.95	$65.86	$63.44	$65.40	$70.27	$68.37	.....	.....
Average price for steel per ton[3]	36.11	35.24	38.17	40.63	39.29	36.64	34.89	39.54	39.9	$38.80	[4] 35.50
Finished steel production per man (all employees)[5]	49	50	38	50	52	51	46	44	49	.....	.....
Finished steel production per man in manufacturing properties[5]	63	71	52	68	72	71	61	62	65	.....	.....
Iron ore production per man in ore properties[6]	786	763	651	663	693	692	680	572	592	.....	.....
Coal and coke production per man in coal and coke properties[6]	1,490	1,554	1,268	1,361	1,434	1,532	1,239	1,116	1,193	.....	.....
Allowances for depreciation, sinking funds, and ordinary repairs	$71,198,000	$64,349,000	$49,350,000	$67,857,000	$64,565,000	$52,046,000	$36,207,000	$51,293,000	$48,814,000	$25,960,000	$531,639,000
Per cent depreciation charges to property account	5.0	4.3	3.3	4.7	4.7	3.8	2.6	3.7	2.7	1.8	....
Total net earnings first quarter	$37,616,876	$22,921,268	$18,229,005	$39,122,492	$36,634,490	$23,025,895	$13,445,232	$25,068,707	$23,715,457	.....	[6] $23,519,203
Total net earnings second quarter	40,170,900	29,340,491	20,265,756	45,503,705	40,125,032	30,305,116	19,490,725	36,642,308	37,662,058	$26,363,840	.....
Total net earnings third quarter	37,365,187	38,246,907	27,106,275	43,804,285	38,114,624	31,240,583	18,773,932	32,422,955	36,945,489	27,663,842	.....
Total net earnings fourth quarter	25,901,730	40,982,746	26,246,675	32,534,191	41,750,126	35,216,063	21,466,632	15,037,181	31,985,759	29,759,910	.....

[1] Mar. 31 1911.
[2] Indications are that exports in 1911 will reach 1,500,000 tons.
[3] Based upon average prices for Bessemer iron, steel billets, tank plates, beams, wire nails, steel bars, steel rails, and tin plate.
[4] Present official price average.
[5] In tons. The Steel Corporation segregates the wages paid and number of employees in the various departments, so that it is possible to obtain the finished steel production per total employees of the corporation as well as the finished steel production per man employed in only the manufacturing departments. Also iron ore and coal and coke production per man based upon employees in these departments.
[6] Quarter ended Mar. 31, 1911.

IRON ORES OF THE UNITED STATES.

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INTRODUCTION.

No previous inventory of the iron-ore supplies of the United States in any detail has ever been published, and the present one must be considered only a first approximation which will be materially modified as new quantitative data are made available by future public and private investigations. The estimates of ore supplies given in this paper are not based upon the judgment of any individual, but so far as possible represent the consensus of opinion of those best qualified to form an opinion. Cordial cooperation in making up the estimates has been given by officers of private corporations and the several state geological surveys and by economic geologists and mining engineers generally. Special acknowledgments are due to Messrs. W. N. Merriam, C. K. Leith, D. H. Newland, H. M. Beuhler, W. S. Bayley, T. L. Watson, R. C. Hills, and J. F. Kemp, who have furnished information which could not have been obtained from any other source.

CHEMICAL CLASSIFICATION.

The commercial ores of iron, on the basis of chemical composition, fall into two main classes, i. e., oxides and carbonates. The latter class is relatively unimportant, furnishing in the United States less than one-twentieth of 1 per cent of the annual production. The oxides are further separated, according to the proportion of oxygen and combined water which they contain, into three classes. The chemical and commercial classification is therefore as follows:

1. *Magnetite.*—Magnetic oxide, Fe_3O_4, including titaniferous magnetite. Theoretical iron content, 72.4 per cent. Generally containing some hematite.

2. *Hematite.*—Anhydrous sesquioxide, Fe_2O_3, including specular and red hematite, red fossil ore, oolitic ore, etc. Theoretical iron content, 70 per cent.

3. *Brown ore.*—Hydrous sesquioxide, $Fe_2O_4nH_2O$, including turgite, limonite, goethite, or a mixture of these minerals, known locally as brown hematite, bog ore, etc. Theoretical iron content, 59.8–66.2 per cent.

4. *Carbonate.*—Siderite, iron carbonate, $FeCO_3$, known locally as spathic ore, black band ore, kidney ore, etc. Theoretical iron content, 48.2 per cent.

GEOLOGIC CLASSIFICATION.

In their geologic relations and mode of occurrence the iron ores may be further classified as follows:

1. *Magmatic segregations in basic igneous rocks.*—The titaniferous magnetites of the Adirondack region represent this type. A characteristic of such deposits is the perfect gradation from the ore into the surrounding rock by an increase in the gangue, which consists of the same minerals as the associated igneous rock. The deposits are of great size and present large possibilities of utilization by concentration or with modification of furnace practice which will permit their economical reduction.

2. *Contact deposits, formed in connection with the intrusion of igneous rocks at their contact with the intruded sediments, generally limestones.*—These appear to be due to ascending heated waters and vapors given off by the cooling igneous rock. The ores include both magnetite and hematite. Typical examples are the Cornwall deposits of Pennsylvania and many of the western iron-ore deposits, as those at Hanover, N. Mex., and Iron Springs, Utah.

3. *Concentration deposits.*—These include all forms of the oxide ores in which the iron, originally disseminated through the rocks, has been dissolved, transferred, and redeposited by circulating waters. It includes most of the brown ores of the Appalachian region in which the iron was originally disseminated through a great mass of limestones and shales and has been leached out and concentrated by surface waters during the erosion of these rocks. In some cases the iron was probably deposited as carbonate or sulphide and subsequently changed in place to hydrous oxide. It includes the bog-ore deposits, which have been formed or are now forming in swamps, to which iron is brought in soluble form as organic compounds and precipitated by the breaking up of those compounds through oxidation.

4. *Replacement deposits.*—These are closely related to the concentration deposits, the principal difference being that the ore-bearing solution has derived the iron from an outside source and deposited it in place of some definite portion of an original rock series, generally a limestone. They include all classes of ores, both oxides and carbonates, their composition depending on the conditions of deposition and the subsequent alterations which they have undergone. An example of this type is the so-called Oriskany ore of Virginia. In this case the iron derived from a great mass of overlying shales has been carried in solution, and where structural conditions were favorable deposited in place of a certain easily soluble bed of limestone for a variable distance from its outcrop.

5. *Bedded deposits.*—These include all deposits in which the ore forms tabular or lenticular bodies which lie parallel to the bedding or foliation of the inclosing rocks. Their origin may be diverse, but their common characteristic is great lateral extent compared with thickness. In many bedded deposits, though not in all of them, the ore is sharply differentiated from the surrounding rocks. Magnetite deposits of this type are the Adirondack ores associated with metamorphic sediments and with gneisses of uncertain origin. Of the hematite deposits of this type are the enormous deposits of the Lake Superior district, where certain beds of the iron formation have been enriched both by the removal of silica in solution and by the depo-

sition of additional iron. It also includes the gray specular ores of Alabama, which are associated with Cambrian and pre-Cambrian slates and sandstones, and the important red ores, fossil and oolitic, which form regular sedimentary beds, differing only in composition from associated Silurian sandstones and shales. Of the carbonates it includes the black-band ores, which occur as layers of nodules or continuous beds associated with the "Coal Measures" in Ohio and Pennsylvania.

6. *Gossan deposits.*—Iron sulphides tend to oxidize with loss of sulphur when exposed to surface weathering, and deposits of pyrite and pyrrhotite are therefore generally covered with a deposit of residual brown ore, which extends down to the level of permanent ground water. Examples of this type are the brown ore on the outcrop of the pyrrhotite veins at Ducktown, Tenn., and the iron-ore capping of many metalliferous veins in the West.

Referred to the ultimate source of the material, it may be stated in general that the iron ores are derived from the iron minerals either segregated or disseminated in igneous rocks or the iron minerals deposited by igneous emanations, which have been worked over in varying degrees by the agents of weathering and sedimentary and chemical deposition at the surface of the earth. Iron compounds are among the most stable substances under surface conditions, and hence the net result of the changes at the earth's surface is to concentrate iron minerals mechanically and chemically as compared with associated minerals.

VALUE OF ESTIMATES.

An understanding of the above chemical and geologic classifications of iron ores is essential for an appreciation of the limitations and uncertainties of any estimate of the ore supplies of the country. It will be readily understood that with the great diversity in type of deposits there must be a very wide difference in the degree of accuracy with which the ore can be estimated. The closest approximation can be made in case of bedded deposits such as the Clinton red hematites. These beds vary in thickness and composition from place to place, but the variations are similar to those characterizing other sedimentary beds such as coal, and with a minimum amount of testing on the outcrop and at depth their contents can be calculated with a fair degree of certainty. Certain assumptions, however, must always be made. Thus it is assumed that observed variations in composition and thickness continue with regularity between and beyond points of observations; also that a certain depth will limit workability. This limiting depth will depend upon a variety of conditions which can not be determined in advance of mining, and hence the depth fixed upon in making calculations will be largely a matter of opinion, and must be expected to change with changing commercial conditions. Hence it is doubtful if even the best known and most thoroughly tested deposits of red hematite can be estimated within 10 per cent of their actual yield. At the other extreme are the concentration deposits of brown ore. These are extremely variable both in depth and horizontal extent. Surface indications are thoroughly unreliable, and those most experienced in working such deposits are practically unanimous in the opinion that no deposit can be safely estimated until every ton of ore has been mined. Under

such circumstances the estimates given below of ore remaining in this class of deposits can only be regarded as having a degree of accuracy represented by a factor varying between 0.7 and 3.

Intermediate between these extremes are the most important deposits, including those of the Lake Superior and Adirondack districts. The former by reason of their greater regularity and the thoroughness with which they have been tested may be considered as known within 15 or 20 per cent. The latter are much less fully tested, and estimates of their probable yield are based upon assumptions which further development may prove to be erroneous. Estimates of the western ore deposits vary in value because of inherent uncertainties due to the nature of the deposits and to the very unequal information concerning different districts.

AVAILABILITY.

Any estimate of the iron-ore supplies of the United States must separate the ores into two classes on the basis of availability. This separation is difficult, and opinions vary widely as to where the line should be drawn. Evidently the question is one of costs: (*a*) The cost of the ore delivered at the furnace and (*b*) the cost of reduction. Actual production, past and present, being determined by the interaction of various factors, affords the best criteria of availability.

The two factors which enter most directly into the cost of ore at the furnace are accessibility and mining conditions. Many iron-ore deposits are known in regions so remote from fuel supply and from transportation lines that they may be considered unavailable at present or so long as they are compelled to compete with more accessible ores. At the same time they must be taken into account in considering the total reserves, for accessibility is only relative and no deposit, if sufficiently large to warrant the expenditure necessary for constructing roads, can be regarded as permanently inaccessible. Distance from fuel is, of course, a more serious drawback than absence of present means of transportation, while those supplied with water transportation will bear a longer haul than those carried entirely by rail.

Mining conditions may be such as to make the cost of raising the ore prohibitive at present. Such conditions are limiting depths beyond which mining, on account of the amount of water, may become very expensive, or thinness of the beds which necessitates a large amount of dead work. These conditions apply particularly to the Clinton ores and explain the difference between the total amount proved in these deposits and the amount considered at present available. Many deposits of brown ore can be worked cheaply in open pits for a certain distance from the surface, while the cost of stripping or of timbering to hold back the inclosing clay prevents their working to greater depths.

Another kind of limiting conditions arises from the fact that in many cases the ore is mixed with foreign material from which it must be separated. Thus many of the brown ores consist of small concretions scattered through clay, and a large amount of material must be passed through the washer to obtain the ore in suitable condition for the furnace. The ratio of ore to clay in deposits now being worked varies from 1:5 down to 1:20. When conditions permit the

lowering of this ratio still further, large quantities of ore will be available in material which can not now be worked at a profit. Similar conditions control the availability of many of the magnetic deposits, except that here the objectionable elements are other minerals that are closely associated with the iron and must be separated by magnetic methods. The concentrated material is a high-grade ore, and the ratio of available to nonavailable in these deposits depends wholly upon cost of the process of concentration which they will bear in competition with other ores.

The second consideration affecting availability is the character of the ore itself. The content of metallic iron in ores used at present varies from 30 to 65 per cent. This wide variation is due in part to the nature of the other elements in the ore and in part to advantageous location. Thus the Clinton ores, containing as low as 30 per cent iron, can be used with advantage, because the lime which they contain makes them practically self-fluxing. At the same time they must be used near the point of production, since the low content of iron will not permit long transportation in competition with richer ores. On the other hand, siliceous ores containing less than 40 per cent iron are not considered at present available unless their location near the fuel is exceptionally favorable, since the cost of transportation per unit of iron is excessive and since a large amount of fuel is required to remove the silica. But there are enormous quantities of siliceous ore carrying from 35 to 40 per cent iron, particularly in the Lake Superior district, and this must be taken into account as a future reserve, though not at present available.

In the case of the titaniferous magnetites the ratio between the available and not available is difficult to determine. While these ores have been used only to a limited extent because of the difficulties attending the fluxing of the titanium, it seems probable that these difficulties will be overcome and a much larger use made of them either by employing a special flux in the furnace or by reducing the percentage of titanium in the charge by concentration or mixing with nontitaniferous ores.

The percentage of other constituents, such as phosphorus, sulphur, copper, chromium, manganese, and alumina, will determine the method and cost of reduction and the quality of the resulting iron. Hence these constituents, some of which are highly deleterious, may determine the question of availability by limiting the conditions under which the ore can be reduced or the product used.

Another factor is the nature of ownership. Where a large corporation controls a variety of ores and is equipped to assemble them and form any desired mixture or grade, ores may be used with advantage which would not be available if held by a smaller company not in a position to control the situation in a large way or compelled to dispose of a single kind of ore in the open market.

Because of the varying importance of these factors, future availability will obviously vary in a corresponding degree and the advantage which one district now possesses may pass to another. As the higher-grade ores of the Lake Superior region become depleted the lower-grade ores will be called upon with consequent increase in cost of transportation and smelting. The low-grade ores of the southeastern district, at present competing with the high-grade Lake Su-

perior ores, will then have a decided advantage because of proximity to fuel supply.

The notable present tendency in the iron industry is the lower average iron content in the ores used. This tendency will undoubtedly continue in the future as the more easily accessible portions of the richer deposits are worked out. As a corollary to this is the observed tendency toward a decentralization of the iron industry, and with a decrease in the iron content of the ore used, involving a corresponding increase in cost of transportation per unit of iron, there will be an increase in the proportion of fuel which goes to the region producing the ore. This will be accompanied by the general adoption of by-product coking. It is an instructive fact that in certain furnaces now operating in the Lake Superior district the profit corresponds approximately to the value of the by-products from the coke ovens.

In making estimates all of these considerations, together with the best forecast that can be made of conditions as they will exist in the next ten years, have been taken into account in determining the ratio between available and nonavailable supplies.

GEOGRAPHIC AND GEOLOGIC DISTRIBUTION.

Iron being one of the most abundant elements, fourth in order of abundance, its natural compounds are found in practically all rocks and soils. To constitute an ore, however, certain of these minerals must be segregated into deposits of sufficient size and purity to permit economical working. Such deposits, considering the entire area of the country, are relatively infrequent. Iron ore is at present produced in only 29 of the 47 States and Territories, and about 79 per cent of the production (1907) was from two States—Minnesota and Michigan. It is evident that the distribution of the deposits is extremely uneven.

For convenience of description of the ores and discussion of the estimates the known ore deposits will be taken up by groups based on distribution and kind. A few deposits are not included in any of these groups, but the total tonnage of ore which they contain is so small as to be negligible in an estimate of the total for the entire country. The groups of deposits to be considered are the following: (1) Lake Superior ores; (2) Adirondack ores; (3) Clinton ores; (4) Appalachian metamorphic ores; (5) Appalachian brown ores; (6) Appalachian carbonate ores; (7) West Tennessee brown ores; (8) East Texas brown ores; (9) Ozark ores; (10) Rocky Mountain metamorphic ores; (11) Igneous contact ores.

(1) LAKE SUPERIOR ORES.

[Based on information furnished chiefly by C. K. Leith.]

GEOLOGIC RELATIONS.

The Lake Superior ores, chiefly hematites with subordinate amounts of magnetite, furnish approximately 80 per cent of the annual iron-ore production of the country. The total production from the region from its opening to the close of 1907 has come from the ancient folded

and metamorphosed pre-Cambrian formations in Michigan, Minnesota, and Wisconsin in proportions shown in the following table:

Geologic sources of Lake Superior iron ores.

State.	District.	Geologic horizon.		
		Keewatin.	Middle Huronian.	Upper Huronian.
		Per cent.	*Per cent.*	*Per cent.*
Minnesota (46.555 per cent)...	Mesabi			39.45
	Vermilion	7.105		
Michigan (50 per cent).....	Gogebic			12.24
	Marquette		21.90	.50
	Menominee, including Crystal Falls, Iron River, etc.			15.46
Wisconsin (3.308 per cent)....	Penokee			1.98
	Menominee (Florence)			1.26
	Baraboo			.068

The iron formations are sedimentary deposits, usually interbedded with slate, quartzite, dolomite, and sometimes with basic extrusives. They consisted originally of chert, containing beds of iron carbonate or of dark-green ferrous silicate granules, called greenalite. As a result of surface oxidation of the iron carbonate and greenalite, the great bulk of the formation within the zone of observation now consists of chert minutely interbedded with limonite or hematite, giving a banded rock variously called ferruginous chert, taconite, or jasper. The average proportion of iron in these siliceous rocks is between 25 and 37 per cent. Numerous slate layers form subordinate proportions of the iron formation.

The iron ores constitute concentrations of ore in the exposed parts of the iron formation, produced mainly by the leaching out of the associated silica, thus leaving the iron in larger percentage, but also partly by solution, transportation, and redeposition of the iron when it was still in its soluble ferrous condition. The agents of alteration are surface waters carrying oxygen and carbon dioxide. The accessibility to the iron formation of these agents therefore determines the location, shape, and size of the ore deposits. The most favorable condition of accessibility is given by wide area of exposure of the iron formation, which is in turn a function of the dip. The flat-lying formation in the Mesabi Range exposes a greater surface to concentrating agents than the steeply dipping formation of similar thickness and character in the Gogebic range, with the result that the proportion altered to ore is much greater in the Mesabi district. A comparison of the actual areas of the different iron formations with their total shipments to date, and with their probable reserves, shows a very close relation between area and amount of ore developed. Also determining accessibility of the concentrating agents to the iron formation are numerous structural conditions, such as joints or faults or impervious pitching basements, favorable to rapid circulation of water. Finally, the texture of the iron formation itself, whether dense or porous, may determine the activity of the circulation of the waters.

It is therefore apparent that the size, shape, depth, and structural relations of the Lake Superior ores are in widest variety. In the

flat-lying formations of the Mesabi Range the ore bodies have wide lateral extent as compared with depth, extremely irregular outlines partly controlled by jointing, abut irregularly on bottom and sides against unaltered portions of the iron formation, and when the glacial overburden is removed, are accessible to surface operations with steam shovels. In steeply dipping beds they have greater vertical as compared with horizontal dimensions, usually abut not only against unaltered parts of the iron formation, but against well-defined impervious walls consisting of slate, quartzite, dolomite, or bosses or dikes of greenstone, and in such beds underground mining is necessary. The maximum depth to which mining has extended is a little over 2,000 feet; the maximum horizontal extent thus far worked in a single mine is less than a mile, but deposits are known to connect for nearly 10 miles. An adequate summary of the variety of structural features of the several districts can not be made within the limits of this paper.

CHARACTER OF THE ORES.

The hematites and limonites making up the great bulk of the Lake Superior ores range in texture from soft and powdery to hard and crystalline. Both kinds usually have large pore space, due to the removal of silica by leaching. Locally, however, where the ores have been buried deeply in the zone of rock flowage, they have become dense, schistose, specular hematites and magnetites lacking pore space. Where the iron formation has been intruded by large masses of igneous rocks the ores are magnetic. The ores range in grade from above 60 per cent in iron down to 25 per cent in the lean parts of the iron formation. The average shipment for 1906 for the entire region was 59.8 per cent in iron. The difference between the iron ore and the iron formation is simply in the proportion of silica present.

The ores mined in the Lake Superior region to date have generally run above 50 per cent in iron. The lowest grade shipped has been about 40 per cent, in the case of local ores in demand for mixtures and favored by cheap mining and transportation. In mining much material running 40 per cent or even less is taken out and mixed with higher-grade ores to give a medium grade. Such low-grade material therefore does not figure obviously in the production. The percentage of iron in the ore mined from the region has fallen slowly but steadily in recent years, but the major part of the shipment is likely to remain above 50 per cent for some years to come. In the present estimate of available ores about 50 per cent of metallic iron has been taken as the minimum. It is fully appreciated that ores below this grade are even now locally available and will soon be used in larger quantities, but such ores as a whole must be considered still as belonging to the future supply. The ore supply of the Lake Superior district available under present conditions is therefore taken to include all ore above 55 per cent iron, estimated at 2,500,000,000 tons, and 25 per cent of all ore containing between 45 and 55 per cent iron, giving a total of 3,500,000,000 tons exclusive of the Clinton ores.

ESTIMATES OF LOW-GRADE ORES.

Difficulties beset estimates of the tonnage of low-grade ores available for the future. The lower limit of such grade must be chosen

somewhat arbitrarily, and when it is chosen there is lack of sufficient analyses of the iron formation as a whole to separate the tonnage above the given grade. The mixing of high-grade and low-grade ores also complicates the situation. Extensive drilling operations have been directed mainly to determine the percentage of ore above 50 per cent and little attention has been given to the grading of ores running below this percentage. The averages of all available analyses from portions of the formation outside of the ore at present available, made by the mining companies of the Lake Superior district, give the following results:

Character of the iron-bearing formations of the Lake Superior district.

DIAMOND-DRILL CORES.

State.	Holes.	Average iron content.	Analyses.	Total footage.
		Per cent.		
Michigan	77	36.52	3,897	22,202
Minnesota	24	38.00	1,094	5,400
Wisconsin	30	36.40	1,517	4,814

OTHER SOURCES.

Michigan:				
Trenches	.....	41.53	94	975
Levels	.....	38.40	905	[a] 7,500

[a] Approximate.

It seems entirely probable, in view of the fact that 40 per cent ore is even now locally in demand, that the depletion of the higher-grade reserves may in time require the use of 35 per cent ore. If so, the tonnage is enormous. Planimeter measurements of areas of the iron formation, multiplied by the depths quite within the limits of actual mining at the present time, give the following results:

Tonnage of iron formations.

District.	Area.	Depth.	Volume.	Quantity.
	Sq. miles.	*Feet.*	*Cu. miles.*	*Tons.*
Michigan:				
Crystal Falls	7.80	1,250	1.950	19,500,000,000
Marquette	28.50	1,250	7.100	71,000,000,000
Menominee	5.60	1,250	1.400	14,000,000,000
Penokee	11.60	1,250	2,900	29,000,000,000
Swanzy	1.00	1,000	.200	2,000,000,000
Minnesota:				
Mesabi	127.00	400	10.000	100,000,000,000
Vermilion	15.60	1,250	3.900	39,000,000,000
Wisconsin:				
Florence	.70	1,250	.175	1,750,000,000
	197.80	.....	27.625	276,250,000,000
Ontario, Canada:				
Animikie	10.80	100	.20	2,000,000,000
Michipicoten	6.64	1,250	1.66	16,600,000,000
Other districts on north shore of Lake Superior	30.00	1,250	7.50	75,000,000,000
	47.44	.....	9.36	93,600,000,000
Total	245.24	.....	36.985	369,850,000,000

It is not proved, however, that this enormous tonnage will average as high in iron as these figures from the mining companies would indicate. Indeed, many parts of the formations are known to run lower than this. It is regarded safer, therefore, to use a smaller figure for the tonnage of ore running 35 per cent and over. Just what fraction of the total tonnage of the iron formations should be taken is a matter of more or less arbitrary choice. It is here put at 72,000,000,000 tons, divided as shown in the following table:

Estimates of Lake Superior ores.

District.	Available.	Not available.
	Long tons.	*Long tons.*
Michigan:		
Marquette district	110,000,000	15,900,000,000
Gogebic district	95,000,000	2,900,000,000
Menominee, Crystal Falls, and other districts	80,000,000	7,360,000,000
Minnesota:		
Mesabi district	3,100,000,000	39,000,000,000
Vermilion district	60,000,000	1,005,000,000
Cayuna and other districts	15,000,000	310,000,000
Wisconsin	40,000,000	4,525,000,000
Total	3,500,000,000	72,000,000,000

(2) ADIRONDACK ORES.

[Based on reports of the New York State Survey.]

The area of crystalline rocks forming the Adirondack district occupies the greater part of the State of New York north of the Mohawk Valley. The district contains a variety of iron ores differing in their character and geologic surroundings. Those found in sufficient abundance to be commercially important are nontitaniferous magnetites, titaniferous magnetites, and red hematites. Some deposits of limonite also occur as bog ores, but they are not generally of sufficient size to be considered an available source of ore at the present time.

The rocks of the Adirondack district, with the exception of small patches of Paleozoic sediments, are entirely pre-Cambrian, and are either wholly crystalline or highly metamorphosed. They are provisionally classed in three groups: (1) Sedimentary rocks, marble, schist, and gneiss; (2) gneisses of undetermined origin, but probably in part, at least, sedimentary; and (3) igneous plutonic rocks, anorthosite, gabbro, syenite, and granite. The first group occupies a relatively small part of the area, but with its various members are associated all of the hematite deposits and many of the nontitaniferous magnetites.

NONTITANIFEROUS MAGNETITES.

These are the most widespread of the Adirondack deposits, but the more important ones occur in two groups on the eastern border of the district in the Lake Champlain basin and in the western part of the district in St. Lawrence County. In the first group are the well-known Hammondville, Mineville, and Lyon Mountain deposits, and in the second the Benson, Jayville, Fine, and Clinton deposits.

The ores show great variation in their mineral and chemical composition, ranging from lean varieties, which consist of magnetite intermixed with the constituents of the wall rock, to those made up of practically pure magnetite. The richest, obtained principally from the Mineville group, average from 60 to 65 per cent iron, and considerable quantities have been obtained which approached the theoretical iron content of magnetite (72.4 per cent). The deposits carrying less than 50 per cent iron are generally considered too refractory for direct smelting and their utilization depends upon concentration. Large bodies of such ore occur in the Lyon Mountain, Arnold Hill, and St. Lawrence County deposits. The lowest grade of ore now worked carries about 35 per cent iron ore before concentration.

Both Bessemer and non-Bessemer ores occur, in some cases in adjoining deposits, though generally the ores from all deposits of a group show a fair degree of uniformity in respect to phosphorus content. The leaner ores are apt to be lowest in phosphorus, and concentrates produced at Lyon Mountain contain less than 0.01 per cent of that element with 65 per cent iron. The ores also carry a variable proportion of sulphur due to the admixture of pyrite and more rarely pyrrhotite.

The deposits occur in a variety of forms such as are common to the magnetites found in gneisses and schists elsewhere. In general they have a lenticular bedded form and are parallel to the foliation of the inclosing rocks. They partake of the same structural folds and faults as these rocks, and must therefore have been deposited before the regional compression occurred to which these structural features are due. While there has been much diversity of opinion regarding the origin of these ores, the view generally held at present is that they were introduced by processes connected with the intrusion of the igneous rocks.

The Adirondack magnetites were mined as early as the latter part of the eighteenth century and supplied many bloomeries and forges and, later, small charcoal furnaces. These have now all disappeared, and the ores are mostly shipped to the iron-making centers for smelting. There are, however, two coke furnaces in the region that are supplied by local mines. The total production up to the present time has been somewhat over 36,000,000 tons. Both open-cut and underground mining methods are employed, but chiefly the latter because of the high inclination of the ore bodies. A depth of 1,500 feet has been reached in the workings at Lyon Mountain, and about 2,000 feet at Barton Hill. Practically all of the ore is concentrated by the magnetic process, which yields concentrates containing from 60 to 65 per cent iron and at the same time effects a partial elimination of the phosphorus and sulphur. In fact, the treatment of the richer ores is designed primarily to reduce the phosphorus, and the concentration is a subordinate object.

While a few of these deposits have been drilled with sufficient thoroughness to permit a fairly definite estimate of their contents, this is not generally the case, and in most cases even the extent of the outcrop is not accurately known. Lines of magnetic attraction indicate the presence of ore bodies concerning which little else is known, and finally large areas in the Adirondack Mountains, heavily forested and drift covered, have not been examined in sufficient detail to determine whether or not they contain iron-ore deposits

For these reasons it is impossible accurately to determine the ore reserves. It is estimated that the known deposits of high-grade ore will yield 35,000,000 tons, and that the leaner deposits, carrying over 35 per cent iron, will yield 75,000,000 tons of concentrates. The estimate of ore which is not now available because of great depth, or low grade, but which may be used eventually, is even more uncertain, but may be placed conservatively at 25,000,000 tons.

TITANIFEROUS MAGNETITES.

Under this class are included the ores which carry titanium as an essential ingredient. In general it amounts to at least 8 per cent of titanic acid (TiO_2), while the average is perhaps 15 per cent. These deposits occur within the margins of the gabbro-anorthosite area, chiefly in Essex and Franklin counties. In their relations to the inclosing rocks these deposits are sharply differentiated from the nontitaniferous magnetites which occur in the sedimentary and eruptive gneisses and schists. The titaniferous ores are believed to be the product of magmatic segregation, and hence intimately connected in origin with associated igneous rocks. The form of the ore bodies has not been accurately determined except in the case of a few of the smaller ones. The large bodies have nowhere been uncovered or sufficiently explored to afford an idea of their precise outlines. The richest ores contain little else than magnetite and ilmenite, and yield fully 60 per cent iron. From such pure aggregates there may be traced a continuous series of gradations by the entering of gangue minerals in increasingly greater proportion to the limiting wall rocks which hold only subordinate amounts of magnetite and ilmenite. The two minerals are often distinct in their crystallization, and show no tendency toward mutual intergrowth.

The use of ores containing high percentages of titanium is generally regarded as impracticable under present furnace practice because of the infusibility of the slags. They have, however, been smelted on a small scale in the Adirondacks, as well as in England and Sweden, and experiments have shown the feasibility of securing a fusible slag by properly proportioning the fluxes. A more promising solution of the problem is found in a reduction of the amount of titanium entering the furnace, both by concentration and by employing these ores as mixtures with nontitaniferous ores. Since the ilmenite is only feebly magnetic, it has been found practicable, at least on an experimental scale, to reduce the titanic oxide from 15 to 8 or 9 per cent by moderately fine crushing and magnetic concentration.

These deposits have been explored only far enough to prove that they contain a very large amount of ore which simply awaits the development of methods for overcoming the metallurgical difficulties due to the presence of the titanium. Assuming that these difficulties will be overcome, it is estimated that the known deposits in the Lake Sanford district alone contain at least 90,000,000 tons sufficiently accessible and high in grade to be now available, and that they may contain in addition 100,000,000 tons, which are not now but will be eventually available as an ore supply.

RED HEMATITES.

Hematite deposits of workable dimensions occur on the northwestern side of the Adirondacks in Jefferson and St. Lawrence coun-

ties. They are associated with the folded pre-Cambrian sedimentary (Grenville) series of schists, limestones, and gneisses, which attain greater areal development in that section than elsewhere in the Adirondack region. The ores are mainly soft, red hematites, with subordinate specular ore, and occupy zones of replacement along the contact of crystalline limestone and schist, and at times in the schist itself, with often a capping of Potsdam sandstone. A peculiar feature is the presence of a greenish mineral—locally called serpentine, but of chloritic nature—which seems to be an alteration product formed by reaction of the iron-bearing solutions upon the feldspathic schists and the occasional granitic intrusions of the walls. The source of the iron may be traced with some certainty to bands of pyrite and magnetite, which abound in the schists and which are subject to rapid weathering and to solution by ground waters. The principal mines have been opened along a narrow belt extending northeast from Antwerp nearly to the village of Gouverneur, but there are a number of outlying deposits that have been worked in former days for the supply of local furnaces. Mining was begun about 1835. Altogether the district has furnished probably 2,500,000 tons of non-Bessemer ore ranging from 45 to 60 per cent iron. The largest mines are the Dickson and Old Sterling near Antwerp and the Caledonia and Spragueville. Of recent years the output has been shipped to New Jersey and Pennsylvania for reduction.

Aside from the actual mine workings the district is practically unexplored, and it is impossible to draw any accurate conclusions as to the quantity of ore that may exist. Judging from the ore bodies developed in the mines recently operative, it seems safe, however, to place the resources at present available at 2,000,000 tons, while an equal quantity may be represented by other deposits that are not now workable by reason of their inaccessibility or other unfavorable circumstances.

Estimates of Adirondack ores.

	Available.	Not available.
Nontitaniferous magnetites:	*Long tons.*	*Long tons.*
High-grade ores	35,000,000	
Concentrating ores (concentrates)	75,000,000	25,000,000
Titaniferous magnetites	90,000,000	100,000,000
Red hematites	2,000,000	2,000,000

(3) CLINTON ORES.

CHARACTER OF THE ORE.

The Clinton iron ore, so named from its typical occurrence at Clinton, N. Y., is an amorphous red hematite mixed with calcium carbonate, silica, aluminum silicate, and other minerals in minor quantities. It includes the varieties known as fossil ore and oolitic ore.

It occurs in lenticular beds analogous to the strata of sandstone, shale, and limestone, with which they are interbedded.

The fossil ore consists of aggregates of fossil organic remains in which the original calcium carbonate has been replaced partly or wholly by ferric oxide. The fossils, which consist of broken and waterworn fragments, were evidently gathered into beds by the action

of waves and currents, and subsequently cemented together by calcium carbonate and ferric oxide. More or less clay material was also included in the beds during their deposition, and this now forms thin seams of shale.

The oolitic ore consists of aggregates of flat grains with rounded edges about the size and shape of flaxseeds. These grains generally lie parallel to the bedding planes of the rock, and the mass is cemented by ferric oxide and more or less calcium carbonate. The flattened grains have a nucleus of quartz, generally very minute, about which successive layers of iron oxide, and, in many instances, thin layers of amorphous silica and aluminous material, have been deposited. One of the two varieties of ore generally predominates in a bed, but in certain localities both fossil and oolitic materials are mixed in nearly equal proportions. The fossil ore, where unweathered, as compared with the oolitic ore in the same condition, is apt to be the more calcareous, while the oolitic ore may carry higher proportions of silica and alumina.

A characteristic of the Clinton ore is that where it has been weathered or acted upon by surface waters the lime carbonate is dissolved out, thereby increasing the content of iron oxide, silica, and other constituents proportionately. Such altered ore is termed "soft ore," and it is usually porous and friable as compared with the unaltered material, which is termed "hard ore." The alteration of the ore beds takes place at the outcrop and extends to depths varying from a few inches to 400 feet, depending on the attitude of the beds and on the thickness and permeability of the overlying rocks. The quantity of the soft ore is relatively small in comparison with the hard ore, and owing to its higher content of iron and its greater accessibility, a large part of the soft ore has already been mined.

In general the hard and semihard ores range in percentages of major constituents as follows: Metallic iron, 30 to 45 per cent; lime, 5 to 20 per cent; silica, 2 to 25 per cent; alumina, 2 to 5 per cent; magnesia, 1 to 3 per cent; phosphorus, 0.25 to 1.5 per cent; sulphur, a trace to 0.5 per cent; and water, 0.5 to 3 per cent. The ore is therefore of non-Bessemer grade. Small quantities of manganese are found in the Clinton ore in places, especially in the South. The content of this mineral seldom exceeds 0.25 per cent. In the soft ore the lime generally runs less than 1 per cent, so that the percentages of the other constituents are proportionately higher.

GEOLOGIC RELATIONS AND DISTRIBUTION.

The Clinton formation, of which the Clinton ore beds are a part, consists of lenticular, overlapping sedimentary beds, chiefly shale, sandstone, and limestone. In some places shale predominates, in others sandstone, and less commonly limestone. One or more iron-ore beds are generally present, although over considerable areas none occur.

The formation has a wide distribution in the eastern half of the United States. In the Mississippi Valley it is present in Wisconsin and Missouri, in the latter State having been recognized in a drill hole by the presence of a bed of iron ore over 8 feet thick at a depth of 2,000 feet. In eastern Wisconsin the formation is represented by a bed of iron ore only, which varies in thickness from 1.5 to 25 feet. In Ohio,

Indiana, and northeastern Kentucky the formation occurs generally with thicknesses of 35 to 50 feet, but containing ore only in the latter State. In northern New York the Clinton rocks extend in a east-west strip from Niagara River to Otsego County. Here the thickness ranges from 32 to 295 feet. In all these States the beds are approximately horizontal or dip at very low angles. In the Appalachian belt from northern Pennsylvania southwestward to central Alabama the Clinton is a well-developed formation, and the beds are generally inclined at angles of 10° to 90°. Its thickness decreases from 2,000 feet in Pennsylvania to about 850 feet in Virginia, 300 to 750 feet in Tennessee, and 200 to 700 feet in Alabama and Georgia.

DISTRIBUTION.

While the total length of outcrop of all the areas of ore-bearing Clinton formation would reach several thousand miles, only a relatively small part of this outcrop contains ore workable under present conditions. The workability of an ore bed depends on its thickness, extent, composition, and attitude, and also upon its situation with respect to transportation routes, fuel, and markets. The first set of factors are of greatest importance, since few areas of good ore are so inaccessible that they will not sooner or later be reached by railroad. Local conditions also play an important part in determining the workability of an ore bed. For instance, in districts where several such beds occur in the formation, as in Alabama, only the thicker and richer ores are now worked, while others that would be at once exploited if they were in Pennsylvania are for the present neglected.

Wisconsin.—In Wisconsin Clinton ore has been produced in Dodge County since 1849. The ore occurs at Iron Ridge in an irregular lens-shaped bed between the "Cincinnati shale" and the Niagaran limestone. Its thickness varies from 1.5 to 25 feet. At other points, within a radius of 10 miles, the same ore bed occurs and it is known to thin out to the east. Toward the west the ore has been eroded, so that the outcrop lies in a westward-facing scarp about 60 feet high, capped by Niagaran limestone. Open-cut and underground mining have been carried on here. The ore as originally mined ran low in lime and contained about 45 per cent iron. It was partially hydrated and represented the "soft ore" of the outcrop. In 1906 the production of ore from Iron Ridge was nearly 90,000 tons, and in 1907 about 22,000 tons. Recent exploration work has proved that a considerable reserve of hard ore remains in this district, amounting to about 40,000,000 tons.

Kentucky.—A bed of Clinton ore, averaging probably more than 2 feet in thickness, occurs in Bath County, Ky., underlying an area of about 8 square miles. This ore lies nearly horizontal, but most of it is below too heavy cover to admit of mining under present conditions. It carries from 30 to 40 per cent iron and 13 to 16 per cent lime carbonate. At present the ore is mined by stripping where the cover is not more than 8 to 10 feet thick. The deposit has produced approximately 190,000 tons, and it is estimated that there are remaining 25,000,000 tons, one-tenth of which may be available under present conditions.

New York.—The belt of ore-bearing Clinton within New York State extends from Rochester on the west nearly to Utica on the east, a distance of about 130 miles. The width of outcrop of the formation reaches a maximum of 5 miles. The beds dip toward the south, fro

45 to 80 feet to the mile. Conditions are extremely favorable for underground mining and should permit work to a distance of 3 to 5 miles from the outcrop wherever the ore is of sufficient thickness. The ore bed that is worked varies in thickness from 1.5 to 4 feet, with an average of about 2.5 feet. It carries 35 to 45 per cent of iron, with an average, where worked, of about 40 per cent. The phosphorus is high, from 0.25 to more than 1 per cent, and the sulphur, while variable, runs from traces up to 0.5 per cent. The ore has been worked in Wayne, Cayuga, and Oneida counties.

An estimate made by the New York State Survey of the tonnage contained in this district, mainly in these three counties, gives a total of 600,000,000 tons. Ore beds less than 1.5 feet thick and at a depth of more than 500 feet, as well as those carrying less than the average content of iron, have been excluded from consideration. Much of this ore, however, is not available under present conditions.

Pennsylvania.—The length of outcrop of the Clinton formation in Pennsylvania is very great owing to its repetition in the many anticlinal folds within the central part of the State. In the counties of Snyder, Mifflin, Juniata, Blair, Huntingdon, and Bedford, three or four thin beds of red ore occur, ranging in thickness from a few inches to more than 2 feet. The ore on the outcrop is usually soft and rich enough to work by stripping, but the hard ore under cover is in most places too thin to be worked at present. In a few places, however, where the beds are from 1 to 2 feet thick, underground drifts and slopes have been driven for short distances in the hard ore. The soft ore carries 40 to 50 per cent of iron and from a trace to 5 or 6 per cent of lime. The hard ore carries 20 to 35 per cent of iron, and in places as much as 25 per cent of lime.

Less than 20,000 tons a year of Clinton ore are now being produced in Pennsylvania, and it is probable that the reserves of this ore at present available in the State are not much in excess of 5,000,000 tons.

Virginia and north Tennessee.—The ore beds in the Clinton in Virginia are generally too thin to be considered important reserves after the soft ore shall have been mined out. In the west-central part of the State beds at Lowmoor range in thickness from 16 to 21 inches, and at Iron Gate from 8 to 12 inches. The soft ore carries 46 to 57 per cent of iron. Nearly 90,000 tons were shipped in 1907 from mines in this district, and at this rate of production most of the easily accessible soft ore will probably be exhausted within ten or twelve years.

The Clinton formation, outcropping along the foot of Cumberland Mountain, is ore-bearing from Cumberland Gap, Va., to La Follette, Tenn. Near Cumberland Gap there are three ore beds ranging in thickness from 6 inches to 2.5 feet. Only the upper bed, the thickness of which ranges from 15 to 20 inches, is workable. Southwestward toward La Follette the ore increases in thickness to 3.5 feet. Here practically all the soft ore has been mined out, so that only a hard ore, carrying 26 to 32 per cent of iron, remains. It is estimated that about 16,000,000 tons of such ore are still available in the Cumberland Gap-La Follette district.

It is possible that future exploration of the extensive areas of Clinton formation within Virginia and West Virginia may reveal additional ore reserves.

Rockwood-Chattanooga-Gadsden district.—This district embraces an area about 30 by 125 miles in the Appalachian valley region of east Tennessee, northwest Georgia, and northeast Alabama. Steeply dipping Clinton strata outcrop in narrow strips on both sides of Walden Ridge and Lookout Mountain and in the Whiteoak Ridge and other synclines of the Tennessee Valley. Ore is mined at North Chattanooga, Rockwood, Cardiff, Euchee, Welker, and Ooltewah, Tenn., and has been mined extensively at Inman. The important mining localities in Georgia are at Rising Fawn and Estelle, and in Alabama at Battelle, Portersville, Crudup, Attalla, and Gadsden.

The workable ore beds range from 2 to 5 feet in thickness and carry from 30 to 40 per cent of iron, 10 to 25 per cent of lime, and 0.5 to 0.7 per cent phosphorus. The use of much of the ore that is low in iron and high in lime depends upon the continuance of supplies of brown ore. The latter is mixed in the blast furnace with red ore that contains more than sufficient lime to be self-fluxing.

Estimates based upon fairly complete examinations place the available Clinton ore of the Rockwood-Chattanooga-Gadsden district at 86,570,000 tons, and the ore that will ultimately become available at 440,000,000 tons.

Birmingham district.—The Birmingham district includes the Clinton ore-bearing areas of Alabama from Springville southwest beyond Woodstock. As in Tennessee and Georgia, the Clinton formation in Alabama outcrops in narrow strips on the flanks of synclinal mountains. The dips range from 10° or 15° to vertical. The most important outcrop is along the crest of Red Mountain for about 25 miles near Birmingham. Other areas of minor importance occur along West Red Mountain near Birmingham. The thickness of the more important ore beds ranges from 2.5 to 12 feet. The ore carries from 30 to 40 per cent of iron, 10 to 25 per cent of lime, 0.3 to 0.6 per cent phosphorus, and from a trace to 0.1 per cent sulphur.

Estimates of tonnage of available ore for the Birmingham-Clinton ore field indicate a supply of probably 358,470,000 tons, and of ore not at present available of about 438,000,000 tons.

SUMMARY AND ESTIMATES.

The Clinton formation has a wide distribution in the central and eastern portion of the United States, but contains commercially important ore beds in only a part of its area. The most important deposits are in the Birmingham, Chattanooga, and New York State districts, while less extensive deposits occur in Virginia, Wisconsin, Pennsylvania, and Kentucky.

It is evident from the above description that the quantity of ore contained in any area of the Clinton formation may be calculated with a fair degree of accuracy, provided sufficient data are available as to its dip and as to variations in thickness and quality of the ore beds. An assumption must be made as to depth-limiting workability under a variety of structural conditions, and since this is a matter of opinion it will vary somewhat widely and introduce corresponding differences in the results. Conditions of blast-furnace practice locally may define the quality of a workable ore. In places where brown ores are available for mixing with Clinton ores, an ore of the latter class can be used as a flux, although it runs so low in iron and so high

in lime that alone it would not be acceptable. The estimates of available ores made by various experts do not, however, differ materially. In case of the total ore which is not now available, but which may be mined eventually, the variance in estimates is much greater, since more unknown factors enter into the problem.

The estimates given below are based upon detailed examinations of the more important districts by the United States Geological Survey for the Birmingham and Chattanooga districts, and by the State Survey for the New York district, with a study of all obtainable drill records.

Estimates of Clinton ores.

District.	Available.	Not available.
	Long tons.	*Long tons.*
Birmingham	358,470,000	438,000,000
Chattanooga	86,570,000	440,000,000
New York	30,000,000	570,000,000
Virginia-North Tennessee	16,000,000	50,000,000
Wisconsin	10,000,000	30,000,000
Pennsylvania	5,000,000	50,000,000
Kentucky-West Virginia	2,500,000	42,500,000

(4) APPALACHIAN METAMORPHIC ORES.

This group includes the deposits of magnetite and specular hematite associated with the crystalline and metamorphic rocks of the Piedmont and Appalachian mountain belts, which extend from southern New York to central Alabama. The ore deposits are not uniformly distributed throughout this area, but are confined to certain portions where geologic conditions have been favorable for their accumulation. The most important districts are (1) the highlands of southern New York and northern New Jersey; (2) the James River district, Virginia; (3) the Cranberry district, North Carolina; (4) the Piedmont district, North Carolina; (5) the Yorkville district, South Carolina; (6) the Talladega gray ore district, Alabama. The last-named district is included in this group for convenience, although it differs materially in its geologic relations from the others.

The ore deposits of this group have the form of lenticular beds or elongated pods, which are interlaminated with the gneisses, schists, or crystalline limestones. The individual deposits vary in thickness from a fraction of an inch up to 50 or even 80 feet, but the majority of the workable deposits are from 4 to 15 feet thick and are apt to show rapid variations by pinching and swelling on both the strike and the dip. They vary in composition from practically pure iron ore to a material containing a large proportion of gangue minerals. In general, the larger deposits contain the smaller proportion of iron and can be worked only by the employment of some method of concentration.

The deposits rarely occur singly, but are more often disposed in rather narrow belts separated by wider belts of barren gneiss and schist. Since the ores were undoubtedly derived from a deep-seated source, there is no reason to anticipate a failure in depth, although pinches and swells are to be expected in the course of deep mining, and the cost of mining will necessarily increase with depth.

The gray hematites of the Talladega district and certain hematite deposits of Virginia and Georgia are here included for convenience, though they occur under entirely different geologic conditions from those above described. These hematites have the appearance of regularly bedded deposits, associated with sedimentary rocks which have suffered only slight metamorphism. Whether or not they were deposited at the same time as the inclosing sediments has not been definitely determined. They possess much greater uniformity, both on the dip and along the strike, than the magnetites in the crystalline rocks, and for practical purposes may be regarded as original bedded deposits.

In view of the irregularities in thickness of the magnetite beds, which can not be determined in advance of thorough prospecting, it is impossible to make any accurate calculation of the amount of ore which they contain even when their area at the surface is known, and this is rarely the case. The following estimates, therefore, are only approximate, particularly the amount assigned to the nonavailable class:

Estimates of Appalachian metamorphic ores.

Ores.	Available.	Not available.
	Long tons.	*Long tons.*
Magnetites, including some titaniferous magnetites and some hematite	47,500,000	74,500,000
Specular hematites, including some limonites	8,000,000	53,000,000

(5) APPALACHIAN BROWN ORES.

GEOLOGIC RELATIONS.

This group embraces those deposits of brown ores associated with the Appalachian belt of closely folded sedimentary rocks which extends continuously from northern Vermont southwestward to central Alabama. It is bounded on the east by the older crystalline and metamorphic rocks of the Appalachian Mountains, and on the west by the younger "Coal Measures." It is underlain by limestones, dolomites, shales, sandstones, and quartzites, ranging in age from Cambrian to Carboniferous. The beds, originally deposited in approximately horizontal layers, have been folded and faulted so that they now occupy all possible attitudes. This has given rise to conditions favorable to the rapid weathering of the rocks. The steeply dipping sandstones and quartzites form sharp ridges, while the more easily eroded limestones, dolomites, and shales form the intervening valleys, their surfaces being generally covered with a deep mantle of residual materials. These rocks, particularly the shales and some of the limestones, contain small quantities of iron minerals, sulphides, carbonates, and silicates, and in the process of weathering and erosion, by which many thousand feet of strata have been removed, the iron originally contained in these widely disseminated minerals has been concentrated, where conditions were favorable, as the hydrated oxide forming the deposits of brown ore. These deposits, while presenting great diversity in form, fall into three classes, known as mountain ores, valley or limestone ores, and Oriskany ores.

MOUNTAIN ORES.

These deposits are so called because they always occur upon the flanks or at the base of a sandstone, chert, or quartzite ridge, and

throughout Virginia, Tennessee, Georgia, and Alabama they are most extensively developed along the extreme eastern margin of the valley belt where the Cambrian quartzite forms a high ridge flanking the crystalline rocks. The quartzite beds dip steeply beneath the overlying shales and limestones, and iron derived from the latter during the process of weathering has been concentrated downward upon this impermeable foot wall. Similar conditions favorable for ore concentration occur elsewhere in the Appalachian belt where the Cambrian quartzite in isolated ridges dips beneath the overlying shales, as at Anniston, Ala., and also at a few points where the lower Carboniferous chert has formed an impermeable foot wall, as at Sugar Valley, Ga. The deposits present great diversity in form, varying from fissure veins and replacement zones in the sandstone and shale, through blanket deposits resting on the quartzite, to irregular pockets scattered through the residual clay. The last are the most abundant and characteristic. Their size can rarely be determined in advance of development, even by systematic prospecting, and estimates of their available tonnage vary between wide limits.

VALLEY OR LIMESTONE ORES.

These are associated with the great limestone and dolomite formations which underlie much of the Appalachian belt. They are also derived from the iron minerals originally disseminated through the rocks and have been concentrated during the process of weathering and erosion. Their location depends on the original abundance of these minerals in the rocks and on favorable conditions for concentration afforded during erosion, in some cases probably by the fracturing of the beds and the consequent free underground circulation of water, and in others by the location of an easily soluble bed of limestone toward which drainage from surrounding areas brought the iron and deposited it as bog ore. They are always embedded in the residual mantle composed of the insoluble portions of the underlying rocks. The deposits vary in form, but generally consist of concretionary masses ranging in size from those containing several tons down to pellets the size of a pea, disseminated through the residual clay.

ORISKANY ORES.

These deposits are more regular in their occurrence, being limited to a definite horizon in the Helderberg limestone immediately beneath the Oriskany sandstone. They are confined to a comparatively small portion of the valley belt, chiefly in southwestern Virginia with a few deposits in Pennsylvania and West Virginia. The iron was originally disseminated in the overlying shales, and wherever these shales occurred in sufficient thickness and the limestone bed occupied a favorable attitude its lime carbonate has been replaced by the iron oxide for a greater or less distance below the surface. The deposits frequently extend continuously for several miles along the outcrop, being made up of a series of lenses which may reach 75 feet in their thickest portions and thin down to a foot or less where adjacent lenses come together. The greatest depth to which the ore has been found is about 600 feet. Where the replacement has been complete and extensive, therefore, it has the form of a bedded deposit and the ore

content can be estimated with some certainty. The deposits consist either of fairly solid ore or of irregular masses and seams of ore embedded in clay.

DEVELOPMENT AND ESTIMATES.

The Oriskany deposits are mined both by stripping on the outcrop and by regular underground mining. The mountain and valley ores are nearly always mined in open pits, in the larger operations by steam shovel, and in a few cases by the hydraulic method. Where hand mining is done, a part of the ore is sent direct to the furnace without other treatment than hand picking, but where the steam shovel is used everything is passed through the washer. In most cases sorting tables and jigs are employed in addition to the washer. By these means the associated materials, consisting of clay, chert, and other rock fragments, are removed from the ore. The average iron content of the ore as shipped is about 45 per cent, and the phosphorus is generally above the Bessemer limit. The deposits of this group, being widely disseminated and easily mined in open pits, furnished a large part of the ores used by the small charcoal furnaces in the early development of the iron industry in the United States. With increase in capacity of furnaces a more reliable ore supply has been sought, and many districts which were formerly heavy producers have been temporarily abandoned. The ore is still in demand, however, chiefly for mixture with the calcareous Clinton ores, and its production will doubtless increase in the future beyond any point previously reached.

From the above description of these brown-ore deposits it will be readily understood that extreme difficulty must attend any attempt to estimate their total tonnage. It is unsafe to base an estimate on the number of known occurrences of the ore multiplied by an average content derived from the known yield of certain deposits which have been worked out, for the best deposits are the ones most apt to be exploited first. The estimates given below are based in part on systematic examination and measurement of all known deposits in certain districts and in part on general considerations of distribution and geologic occurrence. The amounts given in the second column of the table, representing ore not now available, are confessedly little better than guesses and future exploration may show them to be much too low. It should be stated further that estimates made by competent experts differ from the figures here given by a factor varying from 0.7 to 3.

Estimates of Appalachian brown ores.

	Available.	Not available.
	Long tons.	*Long tons.*
New England and New York	1,000,000	1,500,000
Pennsylvania, Maryland, and New Jersey	10,000,000	12,000,000
Virginia, West Virginia, and East Tennessee	35,150,000	136,000,000
Alabama, Georgia, and North Carolina	19,250,000	32,000,000

(6) APPALACHIAN CARBONATE ORES.

This group of deposits includes the beds of carbonate ores and their oxidized outcrops which occur in the Carboniferous rocks within

a broad belt stretching from western Pennsylvania through Ohio into northeastern Kentucky, and probably extending also into Tennessee and Alabama. The rocks occupying this belt are chiefly sandstones and shales, with occasional thin beds of limestone. The beds are nearly horizontal, and the topography is such that the outcrop of any stratum is extremely sinuous and may have a length many times the shortest distance between two points. This combination of structure and topography has an important bearing on the possible utilization of the iron ore.

The group embraces several varieties of ore locally distinguished as limestone ore, block ore, kidney ore, and black-band ore, each of which is accompanied by a corresponding variety of oxidation product. All of the varieties are non-Bessemer ores. The limestone ores are associated with thin beds of limestone, the most widely distributed being the Vanport and Maxville. The ore beds lie immediately above the limestones, which they sometimes entirely replace. They are usually only a few inches thick, but occasionally expand to several feet. For varying distances from the outcrop the original iron carbonate has been oxidized to a dense brown ore, with loss of carbonic acid and increase in proportion of iron. The unaltered carbonate contains 30 to 35 per cent iron, and the alteration product from 43 to 47 per cent.

The block ores are fairly regular bands of iron carbonate, interstratified with shale or fine sandstone. They are more persistent and uniform in thickness than the other varieties. In Kentucky three persistent beds are recognized having a total outcrop of over 450 miles. The quality of the ore varies inversely with the thickness of the beds, the thinnest beds carrying the best ore. The unaltered carbonate carries from 29 to 34 per cent iron, and the brown ore on the outcrop from 33 to 43 per cent.

The kidney ores, as their name implies, are concretionary in form and occur in certain beds of clay shale, rarely forming continuous layers. They grade into the black-band ores, which are usually more or less closely associated with coal beds and contain carbonaceous matter which gives them a black color. These concretionary forms generally contain the purest iron carbonate and on oxidation at their outcrop yield a correspondingly pure limonite, or brown ore.

In the early history of iron making in the United States this ore belt in Pennsylvania, Ohio, and Kentucky contained a large number of small charcoal furnaces and the aggregate amount of ore produced was very considerable. With the disappearance of the forests the iron industry in this region declined, and the use of these ores has practically ceased. The production was confined largely to the oxidized surface ores, which not only were more easily accessible but gave the best results in the primitive furnaces. While the deposits of this group contain a large aggregate tonnage, practically all of it must be classed as not at present available. The principal reason that the ore can not now be worked at a profit is the fact that the nature of the deposits does not permit operations on a large scale. At only a few points are the beds sufficiently thick and persistent for underground mining, and stripping is therefore the method used. The distance which stripping can be carried into the hillside depends on the slope and the thickness of the bed. An average width of the belt from which the ore can be mined has been

assumed as 100 feet, and the average thickness of the ore bed from 10 to 12 inches. The aggregate length of outcrop of the several ore beds has been taken as follows: For Pennsylvania, 866 miles; Ohio, 2,056 miles; and Kentucky, 1,260 miles. With these assumptions the total tonnage of carbonate and associated limonite ores which may ultimately be produced in these three States, and in Tennessee and Alabama, is as follows:

Estimates of Appalachian carbonate ores.

	Available.	Not available.
	Long tons.	*Long tons.*
Pennsylvania		46,000,000
Ohio		200,000,000
Kentucky		60,000,000
Tennessee-Alabama		2,000,000

(7) WEST TENNESSEE BROWN ORES.

This group embraces the ore deposits within a broad belt extending from the northern border of Alabama and Mississippi across western Tennessee and Kentucky. This region is a plateau of moderate elevation which has been dissected by the Tennessee River and its tributaries. The rocks underlying the ore-bearing territory are lower Carboniferous cherty limestones. The ore deposits closely resemble the limestone ores of the Appalachian Valley. They vary in size from scattered concretions embedded in surface cherty clay to bodies having a depth of 120 feet or more and containing upward of half a million tons. The larger deposits are confined to slight depressions in the plateau surface, in which deposits of waterworn bowlders suggest the former presence of streams. The ore was doubtless derived from the accumulation during the process of weathering and erosion of iron contained in minerals disseminated through the higher formations. These ores have been mined for many years, supplying a number of local charcoal furnaces and being shipped for mixture with the calcareous Clinton ores of the Chattanooga and Birmingham districts.

In the absence of detailed examination of this ore belt, estimates of ore tonnage contained in these deposits must rest upon a very small foundation of ascertained fact. A few of the deposits have been studied, as those at Russellville, Mannie, and Goodrich, and the estimates for the entire district are based upon these disconnected observations. These estimates place the available ore at 10,000,000 tons, and the ore not now available, chiefly because of the excessive cost of transportation and of working scattered deposits, at 15,000,000 tons.

(8) EAST TEXAS BROWN ORES.

This group of deposits occurs in the northeastern portion of Texas and the adjacent portions of Louisiana and Arkansas. They differ materially in their geologic relations and in the problems of utilization from the brown ores previously described. The region is underlain by Tertiary formations, chiefly unconsolidated sands, clays, and greensands. The ore forms a fairly uniform layer, rarely averaging

over 2 feet in thickness, and covering large areas. It is at places exposed at the surface and elsewhere covered by soil and sand to a depth of 6 feet or more. The ore averages about 46 per cent of iron, and is above the Bessemer limit in phosphorus. It is generally high in both silica and alumina. The deposits are probably derived from the oxidation in place of beds and nodules of iron carbonate, although it may be in part due to the concentration of iron derived from the greensand and other iron minerals disseminated through adjacent formations. While these deposits contain in the aggregate a large amount of ore of fairly good grade, its utilization presents somewhat serious difficulties. Owing to the thinness of the deposits the ore can not be excavated with steam shovel or other mechanical devices. The scarcity of water in the region will prevent hydraulicking and also economical washing of the ore, so that only the lump ore can be utilized.

These deposits have been mined at a number of points and have supplied a local furnace for some years. The same region is underlain by beds of lignite, one of which at a depth of about 50 feet has a thickness of over 4 feet. Should it prove practicable to use this lignite in blast-furnace practice, directly or as a gas producer, its occurrence in the immediate vicinity of the ores would prove highly advantageous in their utilization.

In the absence of detailed surveys it is not possible to closely estimate the area of the workable deposits. The total area known to be underlain by the ore-bearing formation is about 500 square miles, and of this probably 50 square miles contain a bed averaging 2 feet in thickness, which is taken as the limit of profitable working at the present time. Upon this basis the district is estimated to contain 260,000,000 tons of available ore, and it is probable that it contains twice this amount of ore that is not now available but will be utilized eventually.

(9) OZARK ORES.

[Based on reports of the Missouri State Survey.]

GEOLOGIC RELATIONS.

The Ozark district embraces the southern half of Missouri and a narrow strip along the northern border of Arkansas. It consists of a broad, unsymmetrical, domelike uplift, by which the older rocks are brought to the surface near the center of the district and, dipping outward in all directions, pass under successively younger formations toward its circumference. The oldest rocks in the district are igneous, porphyry and granite, on the irregularly eroded surface of which the Cambrian formations were deposited. The greater part of the district is occupied by cherty, magnesian limestone, with subordinate sandstones and shales.

The district contains four classes of iron ores in deposits of sufficient size to be of commercial importance. These are (1) coarse specular hematite, occurring in veins in porphyry and in associated conglomerate beds; (2) fine specular hematite, occurring in pockets at the contact between Cambrian sandstones and limestones; (3) brown ore, limonite, occurring in pockets in the residual clay and chert derived from the weathering of limestones; and (4) red hematite, occurring as bedded deposits with Carboniferous shales and sandstones. In addition the "Coal Measures" contain occasional thin

beds of iron carbonate, but these are not known in deposits of commercial size. Each of these classes of ore being associated with certain geologic formations, their distribution is dependent on the structure of the district. The porphyry ores are confined to a small district in Iron County, practically to the two localities, Iron Mountain and Pilot Knob. The fine hematites are grouped within an area about 50 miles in diameter, chiefly in Phelps and Crawford counties, where the Roubidoux sandstone occupies the surface. The limonite deposits form two irregular groups, the first occupying the basin of the Osage River and the second extending along the southeastern margin of the district. The deposits of the red hematite are less numerous than the other kinds, and occur chiefly along the northern margin of the district.

SPECULAR PORPHYRY HEMATITE.

The interest in these deposits is chiefly historic, since they are now practically exhausted and thorough testing in the most favorable localities has entirely failed to reveal additional deposits. These were the first iron ores worked west of the Mississippi River and supplied several local furnaces, the first of which was built about 1815. They continued to produce up to 1893 and have had a total production of 4,500,000 tons. The history of the development and exhaustion of these deposits is instructive as illustrating the fallacy of the popular belief that many ore bodies are inexhaustible and showing that they are very definitely limited in the amount of ore which they will yield.

SPECULAR SANDSTONE HEMATITE.

These deposits consist of irregularly circular pockets from 300 to 500 feet in diameter, located in the sandstone and extending downward into the underlying limestone. The ore occurs both as bowlders mixed with fragments of sandstone, chert, and residual clay and as a solid, indistinctly bedded mass. The unaltered ore is a dense, fine-grained blue or gray hematite, which near the surface has been changed largely to soft red hematite or to limonite. The better grades contain 55 to 67 per cent of iron and are generally low in phosphorus. In addition there are large amounts of siliceous ore which are not available under present conditions. The yield of individual deposits may be in excess of half a million tons, and unless erosion has cut into deposits of this size they may afford little or no indication of their presence at the surface. In the absence of thorough testing, surface indications are therefore unreliable as a basis for estimates of the ore content of these deposits. A large amount of uncertainty must be present in any estimate of total tonnage, and the figures given are regarded only as roughly approximate. These deposits at present form the chief source of iron-ore production in the Ozark district.

BROWN ORES.

Deposits of this class occur in very large numbers as irregular pockets in the residual material overlying various limestone formations. They are due to the concentration of iron contained in min-

erals originally disseminated through the rocks which have been removed and were concentrated during the process of weathering and erosion. They are in part also derived from the solution and redeposition at lower levels of other iron ores, as the specular and red hematites. Over 500 localities are listed at which these deposits occur, and while they vary widely in the amount of ore contained, the aggregate tonnage must be very considerable. Owing to the small size of many of these deposits, their distances from transportation places them in the class of ores not at present available. Also, in a considerable proportion of the deposits, the ratio of ore to clay is too low for profitable working at present.

RED HEMATITE.

These ores occur as regularly bedded deposits in certain portions of the lower Carboniferous formations along the northern border of the Ozark district. They are variable in thickness and horizontal extent. The deposits are practically undeveloped, and owing to the low grade of the ore and the thinness and variability of the beds, they can not at present compete with other ores of higher grade and more cheaply mined.

SUMMARY.

The estimates of tonnage contained in the various classes of ore deposits in the Ozark district are summarized in the following table:

Estimates of Ozark ores.

	Available.	Not available.
	Long tons.	*Long tons.*
Sandstone hematite	15,000,000	5,000,000
Brown ore	30,000,000	45,000,000
Red hematite	.....	5,000,000

(10) ROCKY MOUNTAIN METAMORPHIC ORES.

This group embraces the deposits of magnetite and specular hematite associated with crystalline schists and gneisses at various localities in the Rocky Mountain region. They are similar in most particulars to the deposits of the same ores in the crystalline metamorphic belt of the Eastern States. They consist of lenticular beds conforming in dip and strike to the foliation of the inclosing rocks and varying greatly in thickness within short distances, both in depth and along the outcrop. Associated with these beds, and evidently derived from them, are occasionally found secondary fragmental deposits, which are sometimes overlain by later sedimentary or igneous formations.

The best-known deposits of this group occur in the Hartville district, Wyoming, and in the Llano district, Texas. They also occur at various points in Colorado, Nevada, New Mexico, and Arizona, and in general may be expected wherever there are considerable areas of crystalline gneisses and schists. They have been extensively worked in the Hartville district, supplying a part of the ore for the

furnaces at Pueblo, Colo., and being used also to some extent for fluxing silver ores. It is probable that a much larger proportion of the deposits of this group are as yet undiscovered than of any other group of iron-ore deposits. In view of the extremely meager information, estimates of their contents have little value. The ore is generally high grade, though sometimes siliceous, but a large proportion of the deposits are not at present available by reason of remoteness from transportation lines and distance from suitable fuel for their reduction.

(11) IGNEOUS CONTACT ORES.

GEOLOGIC RELATIONS.

This group is based exclusively upon its geologic relations, and the deposits are widely distributed, though the most of them are located in the Rocky Mountain and Pacific States. The essential characteristics of the deposits are the following: They are steeply dipping, lens-shaped bodies, which closely follow the contact of an intrusive igneous mass and an intruded limestone. They occur partly within the igneous rock as dikelike veins and partly within the limestone, but generally at the immediate contact. The limestone is always altered for a variable distance, sometimes several hundred feet from the contact, the alteration consisting in extreme silicification and the development of lime-bearing metamorphic minerals. The ores are magnetite, or more generally an intimate mixture of magnetite and hematite. They are often altered at the surface to red hematite and to some extent to limonite. The original bedding planes of the limestone are sometimes preserved in the ore body. The gangue consists of quartz and aluminous silicates, in part the recrystallized impurities of the limestone and in part minerals introduced along with the iron. The ores are believed to be due to hot solutions rising from a deep-seated source through fissures in the igneous rock at a period closely following its complete or partial solidification.

CORNWALL DISTRICT, PENNSYLVANIA.

The principal eastern representative of this group is in eastern Pennsylvania, where the ore, chiefly magnetite, has been mined since the early part of the eighteenth century. These deposits, of which the Cornwall mine is considered the type, occur at the contact of intrusive masses of Mesozoic diabase and Cambrian limestone. The more easily accessible portions of the deposits have been mined out, but they are estimated to contain 50,000,000 tons of ore, of which about 15,000,000 tons are considered available under present conditions.

IRON SPRINGS DISTRICT, UTAH.

These are the best known of the western representatives of the group. They are located in southwestern Utah, about 250 miles from Salt Lake. The ore, which consists of both magnetite and specular hematite (70 per cent of the former and 30 per cent of the latter), occurs at or near the contact of laccolithic intrusions of andesite in Carboniferous limestone. The aggregate surface of the known ore bodies is 5,430,000 square feet, and the calculated tonnage to a depth of 130 feet is 40,000,000 tons. While this is the greatest depth at

which the ore has been actually observed in prospect pits, a careful consideration of its geologic relations leads to the conclusion that it extends to considerably greater depths, and probably twice the above tonnage may be taken as the amount which is present but not now available. Practically no development has taken place except the sinking of a large number of prospect pits.

OTHER DISTRICTS.

Ore deposits belonging to this group are known to occur at numerous localities throughout the West, but they have not generally been examined in sufficient detail to permit accurate estimates of tonnage being made.

In Utah deposits occur at Bull Valley, about 25 miles southwest of the Iron Springs district and under similar geologic conditions. In California they are found in the Cave Canyon and other districts in San Bernardino County, in the Eagle Mountain district, Riverside County, in Shasta County, and elsewhere. In Nevada large deposits, estimated to contain at least 7,000,000 tons of magnetite and hematite, averaging 63 per cent of iron, are reported to occur in the Lovelocks district, in Humboldt and Churchill counties. Deposits also occur in Lyon County. In Washington deposits which probably belong to this group, although their relations are not known in detail, occur at a number of localities in the northeastern part of the State, in Stevens County. The ores are chiefly magnetite and hematite, though in part altered to limonite.

In Colorado iron-ore deposits occur near Ashcroft, in Pitkin and Gunnison counties, and in the White Pine and Cebolla districts, in Gunnison County. Those of the Ashcroft district occur on both sides of the Elk Mountains, at elevations between 11,000 and 12,000 feet above tide. The deposits are associated with limestones and igneous intrusives. They are of considerable size, the one on the northwest side of the divide being at least 300 feet on the strike and from 40 to 122 feet thick. Its total depth is not known, but it is proved to be at least 100 feet. The greater part of the ore is high in iron and sulphur, but low in phosphorus.

In New Mexico iron-ore deposits occur at Chupadera Mesa and at Fierro, in Grant County. The latter locality has been worked for some years, furnishing a large amount of ore for the Pueblo furnaces. The ore is associated with limestones and igneous intrusions, forming lenses at or near the contact between the two. It is accompanied by metamorphic minerals, as epidote and garnet, which are developed in the contact zone in great abundance. The ore is magnetite with subordinate amounts of hematite, and usually contains a small amount of copper. The greater part of the easily accessible high-grade ore has been mined out.

COMMERCIAL CLASSIFICATION AND SUMMARY OF ESTIMATES.

While the foregoing classification and grouping of the iron-ore deposits is a convenient one for purposes of description and for discussion of the basis and value of tonnage estimates, the grouping does not correspond with commercial conditions, and the estimates already

given are therefore summarized by commercial grades and districts in the following table:

Estimates of iron-ore supplies of the United States.

Commercial districts (States).	Magnetite ores.			
	Nontitaniferous.		Titaniferous.	
	Available.	Not available.	Available.	Not available.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*
1. Northeastern	160,000,000	111,500,000	90,000,000	100,000,000
2. Southeastern	[a] 12,500,000	23,000,000	.....	.....
3. Lake Superior	.....	4,500,000,000	.....	25,000,000
4. Mississippi Valley	.....	.....	.....	.....
5. Rocky Mountain	[a] 51,485,000	[a] 115,440,000	.....	1,500,000
6. Pacific Slope	[a] 68,950,000	11,800,000	.....	2,000,000
Total	292,935,000	4,761,740,000	90,000,000	128,500,000

Commercial districts (States).	Hematite ores.			
	Specular and red.		Clinton.	
	Available.	Not available.	Available.	Not available.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*
1. Northeastern	2,000,000	2,000,000	35,000,000	620,000,000
2. Southeastern	8,000,000	53,000,000	463,540,000	970,500,000
3. Lake Superior	3,500,000,000	67,475,000,000	10,000,000	30,000,000
4. Mississippi Valley	15,000,000	10,000,000	.....	.....
5. Rocky Mountain	4,275,000	2,100,000	.....	.....
6. Pacific Slope	.....	10,000,000	.....	.....
Total	3,529,275,000	67,552,100,000	508,540,000	1,620,500,000

Commercial districts (States).	Brown ores.		Carbonate ores.		Total supplies.	
	Available.	Not Available.	Available.	Not Available.	Available.	Not Available.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
1. Northeastern	11,000,000	13,500,000	.....	248,000,000	298,000,000	1,095,000,000
2. Southeastern	54,400,000	168,000,000	.....	62,000,660	538,440,000	1,276,500,000
3. Lake Superior	.....	.....	.....	.....	3,510,000,000	72,030,000,000
4. Mississippi Valley	300,000,000	560,000,000	.....	.....	315,000,000	570,000,600
5. Rocky Mountain	2,000,000	1,625,000	.....	.....	57,760,000	120,665,000
6. Pacific Slope	.....	105,000	.....	.....	68,950,000	23,905,000
Total	367,400,000	743,230,000	.....	310,000,000	4,788,150,000	75,116,070,000

[a] Includes some hematite.

1. Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Ohio.
2. Virginia, West Virginia, eastern Kentucky, North Carolina, South Carolina, Georgia, Alabama, east Tennessee.
3. Michigan, Minnesota, Wisconsin.
4. Northwest Alabama, west Tennessee, west Kentucky, Iowa, Missouri, Arkansas, east Texas.
5. Montana, Idaho, Wyoming, Colorado, Utah, Nevada, New Mexico, west Texas, Arizona.
6. Washington, Oregon, California.

FOREIGN IRON-ORE SUPPLIES.

In addition to the ore supplies included in the table given above, certain foreign deposits are so situated that they must depend, at least to a considerable extent, upon the American market, and are therefore to be considered practically a part of the available reserves. The most important of these sources of foreign supply are located in Canada, Newfoundland, Cuba, and Mexico. None of these countries has an abundant fuel supply, and therefore either the fuel must be imported or the ore exported. The history of the iron industry indicates that the latter is most likely to occur, particularly when the industry is already established and the chief market for the finished product is near the fuel supply. This tendency may be interrupted by artificial means, such as bonuses and tariffs, but such interference with the natural course of industrial development is only temporary, and in the long run the industry will gravitate to the point of the lowest cost of production.

CANADIAN ORES.

Recent explorations have shown the existence of considerable areas of the iron-bearing formations on the north shore of Lake Superior. The total tonnage of the iron formation in the Animikie, Michipicoten, and other north-shore districts is calculated at 93,600,000,000 tons. If the same proportion of this total be considered low-grade ore as in the Michigan and Minnesota districts it will amount to about 20,000,000,000 tons. Since these north-shore districts are not as yet thoroughly prospected, the ratio between high and low grade ores can not be definitely determined, but it is almost certainly much lower than in the Michigan and Minnesota districts. The best estimate of ore now available in these Canadian districts is 9,000,000 tons.

Deposits of iron ore of the igneous contact type are known to occur in British Columbia, and those on Texada Island have been mined to some extent. These deposits are estimated to contain at least 30,000,000 tons of ore of present commercial grade and probably a considerably larger amount of low-grade and deep ore not now available.

NEWFOUNDLAND ORES.

The most important of these are Clinton ores occurring on Belle Isle. Their area is definitely known and the doubtful factors are the proportion of ore below present commercial grade and the amount of available ore in beds known to extend under the ocean. The supply of available ore has been estimated at 30,000,000 tons, and the amount not now available may be several times this amount.

MEXICAN ORES.

Large deposits of iron ore are known to occur in various parts of Mexico. They are chiefly of the igneous contact and gossan types, and no estimate of any value can be made of their available tonnage. Remoteness from centers of iron production will prevent their extensive exploitation for the present, and they are therefore to be regarded as wholly within the unavailable class.

CUBAN ORES.

By far the most important foreign source of iron ore, measured by the extent of the supplies and their accessibility, is Cuba. The deposits are of two kinds, specular hematites of the Santiago district and brown limonites of the Mayari, Moa, Baracoa, Cubitas, and Pinar del Rio districts. The hematites have been worked extensively since 1884, and for a number of years have furnished more than 50 per cent of the total iron-ore imports. They are estimated to contain about 9,000,000 tons of ore, about half of which is actually measured.

The limonites are widespread residual deposits derived from the weathering of igneous rocks. The ore contains from 43 to 52 per cent of iron, phosphorus below the Bessemer limit, and between 1 and 2 per cent of chromium. These deposits are as yet practically undeveloped, but the more important ones have been fairly well prospected, and it is estimated that they contain an aggregate of 3,000,000,000 tons, at least one-third and possibly one-half of which may be regarded as now available. Most of the deposits are located near the northern coast of the island, so that they have the advantage of cheap water transportation to all parts of the Atlantic seaboard. They are without question destined to play an important rôle in the iron industry of the United States.

SUMMARY OF FOREIGN SUPPLIES.

The total estimated foreign supplies of ore sufficiently high-grade and accessible to mining and transportation to be at present available, and so located as to affect the iron industry of the United States, are shown in the following table:

Estimated foreign iron ores.

	Long tons.
Canada:	
British Columbia, magnetite chiefly	30,000,000
Lake Superior district, hematite chiefly	9,000,000
Nova Scotia, Clinton hematite	4,000,000
Newfoundland, Clinton hematite	30,000,000
Cuba:	
Santiago district, hematite	5,000,000
Mayari, Moa, Baracoa, Cubitas, and Pinar del Rio districts (limonite)	1,500,000,000
Total	1,578,000,000

IMPORTS AND EXPORTS.

The total imports of iron ore since 1889 have been 3 per cent of the domestic production for the same period. They have shown great annual fluctuations, responding quickly to changes in industrial conditions. Since 1904 there has been a steady and rapid increase in imports, and this increase may be expected to continue in the future even more rapidly with the expanding development of the Cuban limonite deposits.

The extent to which foreign ores are now supplying the market is shown by the following table of imports:

Imports of iron ore from foreign countries, 1889–1907.

Year.	Cuba.	Newfoundland and Labrador.	Quebec, Ontario, etc.	Spain.	Other countries.[a]	Total.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
1889	243,255	14,450	4,091	298,568	293,209	853,573
1890	351,814	6,320	22,211	512,933	353,552	1,246,830
1891	257,189	.....	2,126	323,771	329,778	912,864
1892	307,115	.....	8,606	236,957	253,907	806,585
1893	349,977	.....	372	99,640	76,962	526,951
1894	140,025	.....	443	15,057	11,772	167,307
1895	367,255	.....	.....	77,594	79,304	524,153
1896	380,551	20,800	.....	121,132	160,323	682,806
1897	383,820	29,250	.....	66,193	10,707	489,970
1898	165,623	.....	.....	13,335	8,250	187,208
1899	360,813	77,970	.....	145,206	90,093	674,082
1900	431,265	140,535	5,588	253,694	66,749	897,831
1901	526,583	[b] 79,360	163,383	180,810	16,814	966,950
1902	696,375	81,920	203,824	153,527	29,824	1,165,470
1903	613,585	[b] 86,730	169,681	94,720	15,724	980,440
1904	364,630	5,400	77,887	36,810	2,886	487,613
1905	539,935	5,600	104,096	191,861	4,159	845,651
1906	639,362	[b] 125,395	57,890	171,870	65,873	1,060,390
1907	657,133	89,685	26,878	296,318	159,154	1,229,168
Total	7,776,305	763,415	847,076	3,290,006	2,029,040	14,705,842

[a] Belgium, Brazil, British Columbia, England, France, French Africa, French West Indies, Germany, Greece, Italy, Mexico, Netherlands, New Brunswick, Norway, Nova Scotia, Oceania, Portugal, Sweden, Turkey in Asia, Turkey in Europe, Venezuela, etc.
[b] Includes Newfoundland only.

The exportation of iron ores has fortunately never assumed large proportions, as shown by the following table:

Exports of iron ore from the United States, 1899–1907.

Year.	Quantity.	Value.
	Long tons.	
1899	40,665	$76,287
1900	31,460	154,756
1901	64,703	163,465
1902	88,445	294,168
1903	80,611	255,728
1904	213,865	458,822
1905	208,017	530,457
1906	265,240	771,539
1907	278,208	763,422
Total	1,271,214	3,468,945

This export consists chiefly of Lake Superior ores shipped to Canadian furnaces for mixture with local ores. It contains also some high-phosphorus ores from the Adirondack district shipped to Germany. This movement has practically ceased, owing to increased home demand for these ores.

WASTE IN MINING AND REDUCTION.

Where iron ore occurs in the form of bedded deposits and is mined underground, waste is apt to occur from the same causes as in coal mining. These are the leaving of pillars to support the roof, often

unnecessarily large, the leaving of low-grade ore in the mine where it can subsequently be recovered only with difficulty, if at all, and the breaking down of an overlying bed where the lower of two beds in the same territory is mined first. These sources of waste are confined largely to the Clinton ores, and the available facts are insufficient for closely estimating its amount, but the proportion of recovery varies with local conditions between 75 and 90 per cent and is undoubtedly increasing with improvement in mining methods. In computing the available tonnage of the Clinton ores an average recovery of 75 per cent has been assumed. Portions of the Clinton ore beds at present considered of no value because of shale partings and consequently left in the ground might be mined at many points if the shale could be separated from the ore economically. Improvement in cleaning and concentrating methods will undoubtedly make the recovery of much ore of this character possible. In the steeply dipping magnetite and hematite beds practically all ore up to the required grade is mined out, and the ground is generally left in such condition that the mines can be reopened for the recovery of lower-grade ores.

In surface workings waste is confined largely to small operations where quick returns are required, and systematic development is impossible. In such cases much ore is lost by dumping barren strippings and low-grade ore together, so that it can be recovered only with difficulty, if at all. Where the operations are on a large enough scale to warrant the installation of mechanical excavators, and a proper ore-dressing plant, this waste does not occur and practically all the ore in a deposit is recovered. Some waste of finely divided ore occurs in the process of washing brown ores to remove the associated clay, and there is still room for improvement in operations of this kind. If it becomes necessary to mine material which is below the grade of present requirements, but which contains enough iron values to make it a possible ore in the future, such material is stacked so that it will be available at any future time. This policy has been most consistently followed in the Lake Superior district, and when such low-grade ores are required large amounts will be available merely at the cost of loading on the cars.

In the early days of iron making an appreciable part of the iron in the ores went into the slag and was permanently lost. Blast-furnace practice, however, has been so greatly improved in recent years that this source of waste is eliminated and practically all of the iron in the ore is now recovered.

PRODUCTION AND USE OF IRON ORES.

The beginning of the iron industry in America dates from 1645, when a furnace and forge were built at Lynn, in the province of Massachusetts Bay. In the century following a large number of small furnaces and bloomeries were operated in the New England colonies, using bog ores almost exclusively, and during this period Massachusetts was the chief iron producer. In 1734 the richer brown ores of western Connecticut and southern New York were opened and largely replaced the bog ores. The manufacture of iron was begun in eastern Pennsylvania in 1716, and a few years later in northern New Jersey, using the rich magnetites of that region. The industry had a rapid growth, notwithstanding the restriction placed upon it,

and at the time of the Revolution there were over 140 furnaces and bloomeries in operation in this district.

In the fifty years preceding the Revolution a number of furnaces and forges were in operation in Maryland, Virginia, and the Carolinas, located for the most part on the tide-water streams of the coastal plain and using the brown ores associated in small quantities with the clays and sands of the coastal formations. The deposits of magnetite in the crystalline rocks of the Piedmont were also worked during this period to a slight extent.

After the close of the Revolution the iron industry expanded rapidly, following the westward progress of settlement, and had reached western Pennsylvania and the Appalachian Valley of Virginia and Tennessee before the close of the eighteenth century. In the first third of the nineteenth century it had reached as far west as Missouri and north to Michigan. During this period conditions favored a wide distribution of the industry. Charcoal was the only fuel used, and this could always be obtained in the immediate vicinity of the ores. Transportation facilities were very poor, and the small furnaces so situated as to supply the local demand, even working on inferior ores, could compete with the older establishments at a distance. About 1840 a revolution was effected in the iron-making industry by the introduction of anthracite and bituminous coal as a furnace fuel. The capacity of the furnaces was rapidly increased, and with improvement in transportation facilities the industry was concentrated at a relatively few points advantageously located with reference to the new fuel supply. Under the changed conditions the ore was brought to the fuel, hence only the best ore and the largest deposits were worked, and many districts, as Ohio and Kentucky, which had been heavy producers, were practically abandoned. With the decrease in average iron content of ores going into the furnaces, due to the depletion of the richest deposits, there is at present a notable tendency toward decentralization of the industry and a consequent reopening of abandoned ore deposits, though it will never revert to the conditions which prevailed during the charcoal period.

The statistics of iron production during the early years of the industry were not collected, and the total amount of iron ore consumed can not be determined. Not until 1889 were annual statistics of ore production collected, though they are available for the two preceding census years 1870 and 1880, and the annual production of intermediate years may be derived from the known production of pig iron as far back as 1870. Basing an estimate upon the average pig iron production shown for census years prior to 1870, the total iron ore produced from 1810 to 1869 was approximately 49,656,000 tons, and on the annual production of pig iron from 1870 to 1888 it was 153,758,000 tons. These amounts added to the 475,162,000 tons produced from 1889 to 1907 give a grand total of 678,576,000 tons produced since 1810. The amount produced during the Colonial and Revolutionary periods and up to the third census in 1810 is so small in comparison with the total production since that time as to be a negligible quantity.

In deducing the iron ore production from the production of pig iron, it should be borne in mind that a small proportion of this iron was made from imported ores and also that some pig iron is made from other materials than natural ores, as blue billy, zinc residues,

rolling-mill cinder, scrap, etc. On the other hand, iron ore is used for other purposes, as in the manufacture of paint, as a fix or fettling in puddling furnaces, and as a flux in silver smelting, and the amount so used practically offsets the amount of material other than iron ore charged into the blast furnaces.

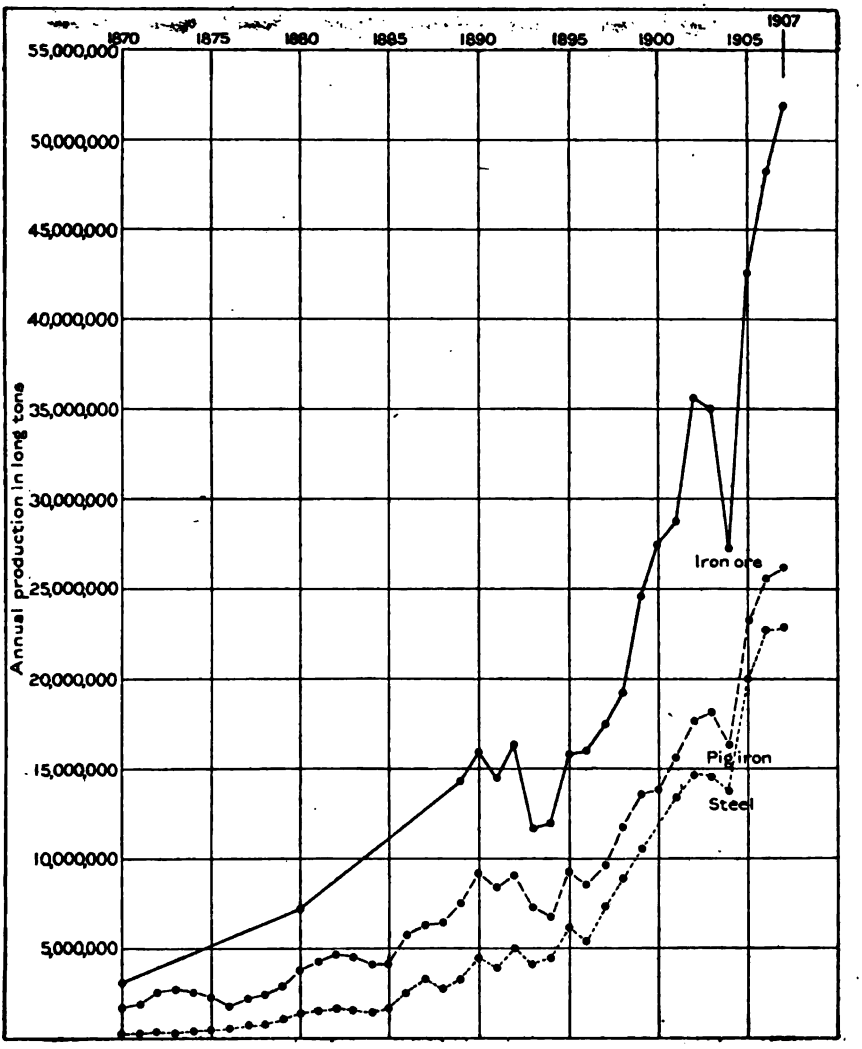

FIG. 1.—Curve showing the production of iron ore, pig iron, and steel in the United States, 1870–1907, in long tons.

The production of iron ore from 1870 to 1907, inclusive, is shown on the accompanying diagram along with the production of pig iron and steel for the same period.

The curve representing the production of pig iron shows more fluctuations than the ore curve, and that representing production of steel more than the pig-iron curve. In other words, the production

of steel responds most promptly to varying industrial conditions. Thus the production of steel in 1907 shows practically no increase over 1906, while the rate of increase in ore is above the average for the preceding eighteen years. This is explained by the fact that the industrial depression of 1907 came so late in the year that it only slightly affected the output of iron ore, particularly in the Lake Superior district, where mining is more active in summer than in winter. It is practically certain, however, that the output of ore for 1908 will show a decided decrease similar to, and probably larger, than that which marked the years 1893–94 and 1904. The years 1892, 1902, and 1907 occupy maximum points in the curve, and each is followed by a decided drop and rapid recovery far beyond the preceding maximum. It may be safely predicted that the curve will resume its upward trend in 1909 after the drop of 1908.

The distribution of the production since 1889 among the varieties of ore enumerated in the chemical classification is shown in the following table:

Production of iron ores in the United States, by varieties, 1889–1907.

Year.	Magnetite.	Hematite.	Brown ore.	Carbonate.	Total.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
1889	2,506,415	9,056,288	2,523,087	432,251	14,518,041
1890	2,570,838	10,527,650	2,559,938	377,617	16,036,043
1891	2,317,108	9,327,398	2,757,564	189,108	14,591,178
1892	1,971,965	11,646,619	2,485,101	192,981	16,296,666
1893	1,330,886	8,272,637	1,849,272	134,834	11,587,629
1894	972,219	9,347,434	1,472,748	87,278	11,879,679
1895	1,268,222	12,513,995	2,102,358	73,039	15,957,614
1896	1,211,526	12,576,288	2,126,212	91,423	16,005,449
1897	1,059,479	14,413,318	1,961,954	83,295	17,518,046
1898	1,237,978	16,150,684	1,980,681	55,373	19,433,716
1899	1,727,430	20,004,399	2,869,785	81,559	24,683,173
1900	1,537,551	22,708,274	3,231,089	76,247	27,553,161
1901	1,813,076	24,006,025	3,016,715	51,663	28,887,479
1902	1,688,860	30,532,149	3,305,484	27,642	35,554,135
1903	1,575,422	30,328,654	3,080,399	34,833	35,019,308
1904	1,638,846	23,839,477	2,140,795	19,212	27,644,330
1905	2,390,417	37,367,655	2,546,062	21,999	42,326,133
1906	2,469,294	42,481,375	2,781,063	17,996	47,749,728
1907	2,679,067	46,060,486	2,957,477	23,589	51,720,619
Total	33,966,599	391,360,205	47,763,384	2,071,939	475,162,127
Percentage of totals for nineteen years	7.1	82.4	10.1	0.4	.....
Percentage of total for 1907	5.2	89.1	5.7	.....	.....

The present relative importance of the several varieties is shown by the percentage and also the increasing importance of the hematite as compared with the other varieties. The combined total productions of brown ore and carbonate for the nineteen years is 2,000,000 tons less than the total production of all varieties for the year 1907.

The distribution of production for 1906 and 1907 among the six commercial districts is shown in the following table:

Production of iron ores in the United States, by commercial districts, in 1906 and 1907.

District.	1906.		1907.	
	Quantity.	Percentage of total.	Quantity.	Percentage of total.
	Long tons.		*Long tons.*	
1. Northeastern	2,582,666	5.40	2,822,822	5.45
2. Southeastern	6,208,140	13.00	6,197,360	12.00
3. Lake Superior	38,035,084	79.66	41,638,744	80.50
4. Mississippi Valley	117,570	.25	230,435	.45
5. Rocky Mountain	806,268	1.70	831,258	1.60
6. Pacific slope	(a)	.....	(a)	.....
Total	47,749,728	100.00	51,720,619	100.00

[a] The small production of California and Washington is included in the production of the Rocky Mountain district.

These figures indicate the commanding position of the Lake Superior district in the iron industry with 79.66 and 80.60 per cent of the total production for the two years.

DURATION OF THE IRON-ORE SUPPLY.

Predictions of the date of exhaustion of the iron-ore reserves involve a number of unknown factors, each of which adds to the uncertainty of the result. Among these factors the following may be mentioned:

1. The uncertainties of the estimates of reserves and the difficulty of fixing the ratio of the two classes have been fully explained in the sections devoted to the description of the ore deposits.

2. The extent to which imported ores will supplement the domestic supply can not be foretold, but it will be an increasingly important factor.

3. The extent to which the reserves will be increased by the discovery of new ore bodies can not be estimated, but it is highly improbable that all the important iron-ore deposits are now known.

4. The ores of the first class will not be entirely exhausted before utilization of the second class begins, and changing conditions, particularly of transportation and metallurgy, will continually shift the line dividing the two classes.

5. The stock of metal which can be reworked is constantly increasing and must eventually reduce the demand for metal obtained directly from the ores.

6. The substitution of other materials for metal now used for certain purposes, particularly for construction, will reduce the consumption to an extent which can not be even approximately estimated, and, on the other hand, the proportion of structures into which iron enters as an important constituent will undoubtedly increase.

7. The per capita consumption of iron ore has shown a rapid increase since the beginning of the iron industry. For 1907 and the four preceding census years it has been as follows: 1870, 180 pounds; 1880, 313 pounds; 1890, 560 pounds; 1900, 806 pounds; and 1907, 1,344 pounds.

8. The increasing cost of iron due to the increase in cost of fuel and the use of lower-grade ores requiring an increased amount of fuel per ton of iron smelted, will induce greater economy in the use of the metal; on the other hand, improvements in metallurgy will tend to secure a larger yield of metal for a given expenditure of fuel and power and may substitute low-grade fuel for the higher-grade coal now required in the blast furnace.

The most striking feature of the iron-ore production curve is the remarkable rate of increase shown in the period covered. Taking the production since 1870 by decades and estimating the last two years of the present decade, 1908 and 1909, the percentage rate of increase for each decade over the one preceding is shown in the following table:

Production of iron ore by decades and rate of increase.

Decade.	Quantity.	Percentage of increase.
	Long tons.	
1870-1879	43,770,827	
1880-1889	91,043,854	108.0
1890-1899	163,989,193	80.1
1900-1909	*392,000,000	138.0

* Approximate.

Each of the above decades, as shown by the production curve, contains a depression in which there was an actual decrease in production, so that they may be taken as fairly representing the tendency of the industry. These rates of increase are such that they do not permit the construction of a curve on which predictions for the future can be based. A comparison of the first and second rates, 108 and 80.1, would indicate a rapid decrease in the rate of increase, which, if continued, would have placed the date of maximum production about 1930. But a comparison of the second and third rates, 80.1 and 138, would indicate a rapid increase in the rate of increase. If the average rate of increase by decades, 108.7 per cent, should be continued, it would require the production in the next three decades of 6,088,000,000 tons. But the ore supply now available in the United States is estimated at 4,788,000,000 tons, which is only 78 per cent of the amount needed on this assumption. It is evident, therefore, that the present average rate of increase in production of high-grade ores can not continue even for the next thirty years, and that before 1940 the production must already have reached a maximum and begun to decline, and a very large use must be made of low-grade ores not now classed as available. The second condition, with its consequent greatly increased cost of iron, is the only thing which can prevent a decline in the iron industry, measured by the amount of pig iron produced, within the next thirty years, unless there is in the meantime very greatly increased importation of foreign ores.

In view of the many factors entering into the problem, the tendency of which is not always determinable, to say nothing of the weight that should be given them, any further prediction as to the date of exhaustion of the iron-ore supplies is so uncertain as to be wholly unprofitable and unwarranted.

No. 13.—IRON ORES: ESTIMATED SUPPLY IN 1908, BY COMMERCIAL DISTRICTS AND SPECIES.

[From Report of National Conservation Commission, prepared by Geological Survey, Department of the Interior.]

Commercial district.	Magnetite ores.			
	Nontitaniferous.		Titaniferous.	
	Available.	Not available.	Available.	Not available.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*
Northeastern [1]	160,000,000	111,500,000	90,000,000	100,000,000
Southeastern [2]	[3] 12,500,000	23,000,000	.....	.....
Lake Superior [4]	.....	4,500,000,000	.....	25,000,000
Mississippi Valley [5]	.....	.....	.....	.....
Rocky Mountain [6]	[3] 51,435,000	[3] 115,440,000	.....	1,500,000
Pacific slope [7]	[3] 68,950,000	11,800,000	.....	2,000,000
Total	[3] 292,935,000	[3] 4,761,740,000	90,000,000	128,500,000

Commercial district.	Hematite ores.			
	Specular and red.		Clinton.	
	Available.	Not available.	Available.	Not available.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*
Northeastern [1]	2,000,000	2,000,000	35,000,000	620,000,000
Southeastern [2]	8,000,000	53,000,000	460,320,000	735,500,000
Lake Superior [4]	3,500,000,000	67,475,000,000	10,000,000	30,000,000
Mississippi Valley [5]	15,000,000	10,000,000	.....	.....
Rocky Mountain [6]	4,275,000	2,100,000	.....	.....
Pacific slope [7]	.....	10,000,000	.....	.....
Total	3,529,275,000	67,552,100,000	505,320,000	1,385,500,000

Commercial district.	Brown ores.		Carbonate ores.		Total supply.	
	Available.	Not available.	Available.	Not available.	Available.	Not available.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Northeastern [1]	11,000,000	13,500,000	.....	248,000,000	296,000,000	1,095,000,000
Southeastern [2]	54,400,000	168,000,000	.....	62,000,000	535,220,000	1,041,500,000
Lake Superior [4]	.....	.....	.....	.....	3,510,000,000	72,030,000,000
Mississippi Valley [5]	300,000,000	560,000,000	.....	.....	315,000,000	570,000,000
Rocky Mountain [6]	2,000,000	1,625,000	.....	.....	57,760,000	120,665,000
Pacific slope [7]	.....	105,000	.....	.....	68,950,000	23,905,000
Total	367,400,000	743,230,000	.....	310,000,000	4,784,930,000	74,881,070,000

[1] Includes Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, and Ohio.

[2] Includes Virginia, West Virginia, Eastern Kentucky, North Carolina, South Carolina, Georgia, Alabama, and East Tennessee.

[3] Includes some hematite.

[4] Includes Michigan, Minnesota, and Wisconsin.

[5] Includes Northwest Alabama, West Tennessee, West Kentucky, Iowa, Missouri, Arkansas, and East Texas.

[6] Includes Montana, Idaho, Wyoming, Colorado, Utah, Nevada, New Mexico, West Texas, and Arizona

[7] Includes Washington, Oregon, and California.

No. 121.—PIG-IRON PRODUCTION,[1] CALENDAR YEARS 1899 TO 1910, AND THE NUMBER OF FURNACES, 1898 AND 1910: BY STATES AND BY GEOGRAPHICAL DIVISIONS.

[From the annual reports of the American Iron and Steel Association.]

State.	Completed furnaces Dec. 31, 1898.	Pig-iron production.[2]												Furnaces.		
														In blast.		Total Dec. 31, 1910.
		1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	June 30, 1910.	Dec. 31, 1910.	
		Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*			
Alabama	44	1,083,905	1,184,337	1,225,212	1,472,211	1,561,398	1,453,513	1,604,062	1,674,848	1,686,674	1,397,014	1,763,617	1,939,147	24	20	50
Colorado	3	[3] 138,880	[3] 159,204	[3] 203,409	[3] 269,930	[3] 270,289	[3] 151,776	[3] 407,774	[3] 413,040	[3] 468,486	[3] 313,071	[3] 382,766	[3] 428,612	4	2	6
Connecticut	5	10,129	10,233	8,442	12,086	14,501	8,922	[4] 15,987	[4] 20,239	[4] 19,119	[4] 13,794	[4] 18,388	[4] 16,582	2	3	3
Georgia	4	[5] 17,835	[5] 28,984	[5] 27,333	[5] 32,315	[5] 75,602	[5] 70,156	[5] 38,699	[5] 92,599	[5] 55,825	[5] 24,345	[5] 26,072	[5] 10,725	0	1	4
Indiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	3	9
Illinois	17	1,442,012	1,363,383	1,596,850	1,730,220	1,692,375	1,655,991	2,034,483	2,156,866	2,457,768	1,691,944	2,467,156	2,675,646	20	11	26
Kentucky	9	119,019	71,562	68,462	110,725	102,441	37,106	63,735	98,127	127,946	45,096	86,371	100,509	3	2	8
Maryland	8	234,477	290,073	303,186	303,229	324,570	298,441	332,096	386,709	411,833	183,502	286,856	326,214	4	2	5
Massachusetts	3	2,476	3,310	3,386	3,360	3,265	3,149	.....	.....	.....	.....	.....	.....	1	1	2
Michigan	12	134,443	163,712	170,762	155,213	244,709	238,225	288,704	369,456	[6] 436,507	[6] 348,096	[6] 964,289	[6] 1,250,103	11	9	16
Minnesota	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	1
Missouri	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	2
New Jersey	10	127,598	170,262	155,746	191,380	211,667	262,294	311,089	379,890	373,189	225,372	294,474	264,781	3	2	9
New York	19	264,346	292,827	283,662	401,369	552,917	605,709	1,198,068	1,552,659	1,659,752	1,019,495	1,733,675	1,938,407	18	15	29
North Carolina	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0	0
Ohio	55	2,378,212	2,470,911	3,326,425	3,631,388	3,287,434	2,977,929	4,586,110	5,327,133	5,250,687	2,861,825	5,551,545	5,751,067	50	35	76
Oregon	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0	1
Pennsylvania	158	6,558,878	6,365,935	7,343,257	8,117,800	8,211,500	7,644,321	10,579,127	11,247,869	11,348,549	6,987,191	10,918,824	11,272,120	116	74	164
Tennessee	19	346,166	362,190	337,139	392,778	418,368	302,096	372,692	426,874	393,106	290,826	333,845	397,569	12	10	20
Texas	4	5,803	10,150	2,273	3,095	11,658	5,530	.....	.....	.....	.....	.....	.....	0	0	4
Virginia	27	365,491	490,617	448,662	587,216	544,034	310,526	510,210	488,525	478,771	320,458	391,134	444,976	11	9	26
Washington	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0	1
West Virginia	4	187,858	166,758	166,597	183,005	199,013	270,945	298,179	304,584	291,066	65,551	228,282	174,661	1	1	4
Wisconsin	6	[7] 208,175	[7] 184,794	[7] 207,551	[7] 273,987	[7] 283,516	[7] 210,404	[7] 351,415	[7] 373,323	[7] 322,063	[7] 148,938	[7] 348,177	[7] 307,426	4	4	7
Grand total	414	13,620,703	13,789,242	15,878,354	17,821,307	18,009,252	16,497,033	22,992,380	25,307,191	25,781,361	15,986,018	25,795,471	27,298,545	293	206	473

Geographical divisions:[8]																
New England and Middle States....	207	7,385,762	7,299,398	8,264,276	9,212,229	9,517,433	9,088,781	12,784,496	13,891,400	14,108,508	8,494,905	13,480,499	13,992,765	145	98	216
Southern States....	109	1,938,219	2,147,840	2,109,081	2,548,340	2,713,496	2,178,927	2,589,398	2,775,973	2,742,822	2,077,789	2,601,039	2,892,926	50	42	112
Western States.....	97	4,296,722	4,342,004	5,504,997	6,060,738	5,778,323	5,229,325	7,668,486	8,639,818	8,935,531	5,363,374	9,713,933	10,412,854	98	66	143
Pacific States.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
December 31—																
Furnaces in blast..	202	289	232	266	307	182	261	313	340	167	236	338	.....	.....	.....	206
Furnaces out of blast.....	212	125	174	140	105	243	168	111	89	276	223	331	.....	.....	.....	267

[1] In tons of 2,240 pounds.

[2] Includes spiegeleisen, ferromanganese, ferrosilicon, ferrophosphorus, etc.

[3] Includes Missouri; Washington is also included from 1900; California is included from 1907

[4] Includes Massachusetts.

[5] Includes North Carolina and Texas to 1903 and Texas only from 1904 to 1910.

[6] Includes Indiana from 1907.

[7] Includes Minnesota.

[8] New England and Middle States: Connecticut, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, and West Virginia. Southern States: Alabama, Georgia, Kentucky, North Carolina, Tennessee, Texas, and Virginia. Western States: Colorado, Illinois, Indiana, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. Pacific States: Oregon, Washington, and California.

No. 122.—PIG-IRON PRODUCTION:[1] QUANTITIES AND KINDS, CALENDAR YEARS 1904 TO 1910, BY STATES.

[From the annual reports of the American Iron and Steel Association.]

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

State.	1904	1905	1906	1907	1908	1909	1910
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
New York	134,762	189,423	173,341	117,288	355,009	696,431	649,082
New Jersey							
Pennsylvania	1,091,641	1,485,092	1,387,345	1,254,266			
Maryland	1,737	.....	.....	.....	.....	.....	.....
Total	1,228,140	1,674,515	1,560,686	1,371,554	355,009	696,431	649,082

CHARCOAL PIG IRON.

Massachusetts	3,149						
Connecticut	8,922	16,991	20,289	19,119	[2]14,494	[2]20,629	[2]16,632
New York	29,904						
Pennsylvania	2,593	3,294	2,663	2,289	2,479	2,691	4,142
Maryland	5,335	2,071	4,903	1,444	3,298	5,568	1,555
Virginia							
Tennessee							
Texas	8,180						
Kentucky		21,857	[3]27,018	20,519	19,474	14,684	9,458
Georgia	24,648						
Alabama	30,492	25,548	25,830	35,141	23,815	33,641	35,704
Ohio	988	4,175	5,450	2,425	2,400	.....	1,060
Michigan	171,519	210,573	281,368	294,922	143,492	231,733	260,805
Wisconsin							
Missouri	51,799	68,419	65,536	[4]61,538	[3]39,694	[4]67,037	[4]65,026
Washington							
California							
Total	337,529	352,928	433,007	437,397	249,146	376,008	394,377

BITUMINOUS COAL AND COKE PIG IRON.

New York	547,184	1,111,885	1,505,201	1,659,752	1,018,795	1,731,434	1,938,357
New Jersey	156,158	206,795	253,507	255,901	192,852	256,846	262,669
Pennsylvania	6,550,087	9,090,741	9,857,861	10,091,994	6,662,723	10,255,330	10,621,008
Maryland	290,905	331,870	385,300	411,833	183,502	284,356	325,614
West Virginia	270,945	298,179	304,534	291,066	65,551	228,282	174,661
Kentucky	37,106	63,381	95,945	125,984	48,172	84,016	98,951
Tennessee	299,446	370,217	424,341	390,606	288,316	330,909	394,078
Virginia							
North Carolina	851,498	528,036					
Georgia			550,327	517,095	326,465	404,725	450,342
Texas	.....	.....					
Alabama	1,423,021	1,578,514	1,649,018	1,651,533	1,373,199	1,729,976	1,908,443
Ohio	2,976,941	4,581,935	5,321,683	5,248,262	2,858,925	5,551,545	5,750,007
Illinois	1,655,991	2,034,483	2,156,866	2,487,768	1,691,944	2,467,156	2,675,646
Indiana[4]							
Wisconsin	218,342	332,057	354,391	356,268	[5]315,985	[5]971,887	[5]1,194,022
Michigan							
Minnesota							
Missouri							
Colorado	153,745	436,844	454,524	512,348	310,934	424,625	466,288
Washington							
Total	14,931,364	20,964,937	23,318,496	23,972,410	15,331,863	24,721,087	26,255,086

[1] In tons of 2,240 pounds.
[2] Includes a small quantity of pig iron made with charcoal and electricity.
[3] Includes about 500 tons of pig iron made in Georgia in 1906 with charcoal and coke mixed as fuel.
[4] The production of Indiana is included with Wisconsin and Michigan for 1907, 1908, 1909, and 1910 only. Prior to 1907 Indiana had not made pig iron for a number of years.
[5] Includes a small quantity of iron made experimentally in Michigan with manufactured gas.

No. 123.—CRUDE-STEEL PRODUCTION: QUANTITIES AND KINDS, 1877 TO 1909.

[From the annual reports of the American Iron and Steel Association.]

Calendar year.	Bessemer ingots and castings.	Open-hearth ingots and castings.	Crucible ingots and castings.	All other steels.	Total.
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
1877	500,724	22,849	86,098	10,647	669,618
1878	653,773	32,255	88,309	7,640	781,977
1879	829,489	50,259	50,696	4,879	935,273
1880	1,074,262	100,851	64,664	7,558	1,247,335
1881	1,374,247	131,202	80,145	2,720	1,588,314
1882	1,514,687	143,341	75,973	2,691	1,736,692
1883	1,477,345	119,356	71,885	4,999	1,673,535
1884	1,375,581	117,515	53,270	4,563	1,550,879
1885	1,519,480	133,376	57,599	1,515	1,711,920
1886	2,269,190	218,973	71,973	2,367	2,562,503
1887	2,936,033	322,069	75,375	5,594	3,339,071
1888	2,511,161	314,318	70,279	3,682	2,899,440
1889	2,930,204	374,643	75,865	5,120	3,385,732
1890	3,688,871	513,232	71,175	3,798	4,277,071
1891	3,247,417	579,753	72,586	4,484	3,904,240
1892	4,168,435	669,389	84,709	4,648	4,927,581
1893	3,215,686	737,890	63,613	2,806	4,019,995
1894	3,571,313	784,986	51,702	4,081	4,412,082
1895	4,909,128	1,137,182	67,666	958	6,114,834
1896	3,919,906	1,298,700	60,689	2,394	5,281,689
1897	5,475,315	1,608,671	69,959	3,012	7,156,957
1898	6,609,017	2,230,292	89,747	3,801	8,932,857
1899	7,586,554	2,947,316	101,213	4,974	10,639,857
1900	6,684,770	3,398,135	100,562	4,862	10,188,329
1901	8,713,002	4,656,309	98,513	5,471	13,473,595
1902	9,138,363	5,687,729	112,772	8,386	14,947,250
1903	8,592,529	5,829,911	102,434	9,804	14,534,978
1904	7,859,140	5,908,166	88,391	9,190	13,859,887
1905	10,941,375	8,971,376	102,238	8,963	20,023,947
1906	12,275,830	10,980,013	127,513	14,380	23,398,136
1907	11,667,749	11,549,736	131,234	14,075	23,362,594
1908	6,116,755	7,836,729	63,631	6,132	14,023,247
1909	9,330,783	14,493,936	107,355	22,947	23,955,021

No. 124.—IRON-ORE PRODUCTION: QUANTITIES, BY STATES AND TERRITORIES, CALENDAR YEARS 1904 TO 1909.

[From reports of the Geological Survey, Department of the Interior.]

State or Territory.	1904	1905	1906	1907	1908	1909
	Long tons.	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*
Alabama	3,699,881	3,782,831	3,996,098	4,089,458	3,734,438	4,321,252
Arkansas and Texas	[1]	[1]	[2]36,660	118,667	[2]55,966	[2]6,474
Colorado	150,972	133,471	14,078	11,714	10,176	10,000
Connecticut and Massachusetts	21,990	25,981	31,343	37,166	28,112	38,272
Georgia	293,802	[3]257,124	411,230	444,114	321,060	221,016
Kentucky, Maryland, and West Virginia	[4]594,896	[4]785,414	46,940	62,808	53,235	98,657
Michigan	7,089,887	10,885,902	11,822,874	11,830,342	8,839,199	11,900,384
Minnesota	12,728,835	21,735,182	25,364,077	28,969,658	18,652,220	28,975,149
Missouri	49,285	113,012	80,910	[5]111,768	98,414	89,954
Montana, Nevada, New Mexico, Utah, and Wyoming	[6]210,945	[7]718,299	792,190	[8]819,544	[9]518,449	[9]766,416
New Jersey	499,949	526,271	542,518	549,760	394,767	543,720
New York	842,908	1,139,937	1,041,992	1,876,020	697,473	1,015,333
North Carolina	64,847	[10]	56,057	50,439	48,522	61,150
Ohio	15,672	19,989	17,384	23,589	26,585	16,527
Pennsylvania	397,107	808,717	949,429	837,287	443,161	666,889
Tennessee	500,982	734,770	870,734	813,690	635,343	657,795
Virginia	[11]	[11]	828,081	786,856	692,223	837,847
Wisconsin	483,475	859,283	848,133	838,744	733,993	1,067,436
Total	27,644,390	42,326,133	47,749,728	51,720,619	35,983,336	51,294,271

[1] Texas included under Montana, etc.; also Arkansas in 1905.
[2] Texas only.
[3] Includes North Carolina.
[4] Includes Virginia; also Iowa in 1905.
[5] Includes Iowa.
[6] Includes Texas.
[7] Includes Arkansas and Texas.
[8] Includes California and Washington.
[9] Includes Washington.
[10] Included under Georgia.
[11] Included under Kentucky, etc.

No. 274.—PIG IRON PRODUCED, IMPORTED, EXPORTED, AND RETAINED FOR CONSUMPTION: QUANTITIES (IN TONS OF 2,240 POUNDS), 1867 TO 1910.

Period.[1]	Production.[2]	Export of domestic.	Domestic retained for consumption.	Imports.[3]	Export of foreign.	Total retained for consumption.	Per cent of consumption, foreign.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	
1867–70[4]	1,413,306	590	1,412,716	128,608	70	1,541,254	8.34
1871–80[4]	2,188,526	5,393	2,183,133	188,125	400	2,365,858	7.72
1881–90[4]	5,153,453	7,886	5,145,567	311,224	1,058	5,455,733	5.69
1891	9,202,703	13,435	9,189,268	81,916	260	9,270,924	.88
1892	8,279,870	15,940	8,263,930	82,891	159	8,346,662	.99
1893	9,157,000	20,068	9,136,932	62,986	100	9,199,768	.61
1894	7,124,502	26,529	7,097,973	25,763	103	7,123,633	.36
1895	6,657,388	22,517	6,634,871	14,174	115	6,648,930	.21
1896	9,446,308	29,862	9,416,446	88,125	572	9,503,999	.98
1897	8,623,127	168,890	8,454,237	22,159	205	8,476,191	.26
1898	9,652,680	236,868	9,415,812	25,640	376	9,441,076	.21
1899	11,773,934	299,641	11,474,293	23,316	741	11,496,868	.20
1900	13,620,703	160,690	13,460,013	61,100	157	13,520,956	.45
1901[5]	13,789,242	255,253	13,533,989	39,325	222	13,573,092	.29
1902[5]	15,878,354	54,704	15,823,650	158,961	200	15,982,411	.99
1903[5]	17,821,307	18,198	17,803,109	956,198	1,950	18,757,357	5.08
1904[5]	18,009,252	34,635	17,974,617	191,135	554	18,165,198	1.05
1905[5]	16,497,033	56,971	16,440,062	122,977	1,762	16,561,277	.73
1906[5]	22,992,380	59,509	22,932,871	271,790	3,160	23,201,501	1.16
1907[5]	25,307,191	85,000	25,222,191	564,846	5,663	25,781,374	2.17
1908[5]	25,781,361	52,518	25,729,843	204,092	1,730	25,931,205	.78
1909[5]	15,936,018	50,178	15,885,840	104,655	1,640	15,988,855	1.64
1910[5]	25,795,471	79,771	25,715,700	237,594	627	25,952,667	.91

[1] The periods relate to years ended June 30.
[2] The production is of the calendar year preceding the fiscal year.
[3] Mostly ferromanganese.
[4] Average for the period.
[5] Does not include data with respect to commerce between the United States and insular possessions.

No. 275.—IRON AND STEEL RAILROAD BARS PRODUCED, IMPORTED, EXPORTED, AND RETAINED FOR CONSUMPTION: QUANTITIES (IN TONS OF 2,240 POUNDS), 1867 TO 1910.

Period.[1]	Production.[2]			Export of domestic.	Domestic retained for consumption.	Imports.	Export of foreign.	Total retained for consumption.
	Iron.	Steel.	Total.					
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
1867–70[3]	440,571	4,336	444,907	299	444,608	191,210	280	635,538
1871–80[3]	501,728	252,560	754,288	2,549	751,739	169,338	4,676	916,401
1881–90[3]	123,821	1,310,152	1,433,973	4,655	1,429,318	97,731	9,059	1,517,990
1891	13,882	1,871,425	1,885,307	15,881	1,869,426	134	19	1,869,541
1892	8,240	1,298,936	1,307,176	8,260	1,298,916	299	100	1,299,115
1893	10,437	1,541,407	1,551,844	15,698	1,536,146	932	.....	1,537,078
1894	6,090	1,130,368	1,136,458	16,645	1,119,813	2,178	1,338	1,120,653
1895	4,674	1,017,098	1,021,772	12,192	1,009,580	784	655	1,009,709
1896	5,810	1,300,325	1,306,135	27,645	1,278,490	1,056	.....	1,279,546
1897	4,347	1,117,663	1,122,010	112,172	1,009,838	7,777	.....	1,017,615
1898	2,872	1,645,020	1,647,892	232,552	1,415,340	529	402	1,415,467
1899	3,319	1,977,922	1,981,241	277,885	1,703,356	624	.....	1,703,980
1900	1,592	2,271,108	2,272,700	347,805	1,924,895	2,487	.....	1,927,382
1901[4]	695	2,384,987	2,385,682	374,978	2,010,704	1,091	.....	2,011,795
1902[4]	1,730	2,872,909	2,874,639	167,456	2,707,183	15,017	3	2,722,197
1903[4]	6,512	2,941,421	2,947,933	22,977	2,924,956	122,444	564	3,046,836
1904[4]	667	2,991,810	2,992,477	162,407	2,830,070	58,358	565	2,882,863
1905[4]	871	2,283,840	2,284,711	409,507	1,875,204	17,025	29	1,892,200
1906[4]	818	3,375,611	3,375,929	345,826	3,030,103	9,635	2	3,039,736
1907[4]	15	3,977,872	3,977,887	291,322	3,686,565	4,610	.....	3,691,175
1908[4]	925	3,632,729	3,633,654	278,867	3,354,787	2,839	.....	3,357,626
1909[4]	71	1,920,944	1,921,015	234,128	1,686,887	1,292	.....	1,688,179
1910[4]	.....	3,023,845	3,023,845	369,578	2,654,267	7,030	.....	2,661,297

[1] The periods relate to years ended June 30.
[2] The production is of the calendar year preceding the fiscal year.
[3] Average for the period.
[4] Does not include data with respect to commerce between the United States and insular possessions.

No. 276.—TIN PLATES, TERNEPLATES, AND TAGGERS TIN PRODUCED, IMPORTED, EXPORTED, AND RETAINED FOR CONSUMPTION: QUANTITIES, 1899 TO 1910.

Year ended June 30—	Production.[1]	Exports of domestic.	Domestic retained for consumption.	Imports.	Exports of foreign.	Total retained for consumption.	Per cent of consumption, foreign.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	
1899	732,289,600	205,910	732,083,690	108,484,826	497,813	840,070,703	12.85
1900	808,360,000	319,579	808,040,421	147,963,804	850,228	955,153,997	15.40
1901	677,969,609	1,367,405	676,602,195	117,880,812	519,400	793,963,107	14.78
1902	894,411,840	2,405,812	892,006,028	198,996,066	183,738	1,090,818,381	18.23
1903	806,400,000	1,555,146	804,844,854	109,913,293	79,190	914,678,957	12.01
1904	1,075,200,000	8,107,666	1,067,092,334	126,909,360	1,120	1,194,000,574	10.63
1905	1,026,384,851	22,990,816	1,003,394,035	161,066,820	180,550	1,164,280,305	14.00
1906	1,105,440,000	25,967,137	1,079,472,863	120,819,732	57,648	1,200,234,947	10.06
1907	1,293,740,000	19,894,288	1,273,845,712	142,529,406	1,879	1,416,373,739	10.06
1908	1,153,097,000	33,622,717	1,119,474,283	140,739,972	59,074	1,260,155,181	11.17
1909	1,203,075,000	11,411,104	1,191,663,896	117,312,174	11,000	1,308,965,070	9.00
1910	1,370,788,000	26,168,315	1,344,619,685	154,566,599	197,600	1,498,988,684	10.30

[1] Production is of the calendar year preceding the fiscal year.

No. 335.—Statistical Record of the Progress of the United States, 1800–1910—Continued.

Year.	Production of principal commodities—Continued.						
	Natural gas.*	Petroleum.*	Phosphate rock.	Iron ore.*	Pig iron.*	Steel.*	Quicksilver.*
	Dollars.	*Gallons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Long tons.*	*Flasks.*
1800							
1810					53,908		
1820					20,000		
1830					165,000		
1840					286,903		
1850					563,755		
1851							
1852							
1853							
1854					657,338		
1855					700,150		
1856					788,515		
1857					712,640		
1858					629,548		
1859		84,000			750,560		
1860		21,000,000			821,223		
1861		88,771,578			653,164		
1862		128,380,980			703,270		
1863		109,674,978			846,075		
1864		88,876,578			1,014,282		
1865		104,903,400			831,770		
1866		151,103,400			1,205,663		
1867		140,586,000			1,305,923	19,643	
1868		153,136,914			1,431,250	26,786	
1869		177,030,000			1,711,287	31,250	
1870		220,951,290		[1] 3,031,891	1,665,179	68,750	
1871		218,619,828			1,706,793	73,214	
1872		264,314,148			2,548,713	142,954	
1873		415,539,012			2,560,963	198,796	
1874		458,931,090			2,401,262	215,727	
1875		510,825,888			2,023,733	380,799	
1876		383,572,098			1,868,961	533,191	
1877		560,715,246			2,066,594	569,618	
1878		646,668,456			2,301,215	731,977	
1879		836,394,132			2,741,853	935,273	
1880		1,104,017,166	211,377	[1] 7,120,362	3,835,191	1,247,335	50,926
1881		1,161,771,996	266,734		4,144,254	1,588,314	60,851
1882	215,000	1,281,454,860	332,077		4,623,323	1,736,092	52,732
1883	475,000	984,884,886	378,380		4,595,510	1,673,535	46,725
1884	1,460,000	1,017,174,396	431,779		4,097,868	1,550,879	31,913
1885	4,857,200	918,068,970	437,856		4,044,526	1,711,920	32,073
1886	10,012,000	1,178,723,322	420,549		5,683,329	2,562,603	29,981
1887	15,817,500	1,187,906,286	480,558		6,417,148	3,339,071	33,825
1888	22,629,875	1,159,705,050	448,567		6,489,738	2,899,440	33,250
1889	21,097,099	1,476,867,446	550,245	14,518,041	7,603,042	3,385,732	26,484
1890	18,792,725	1,924,590,024	510,499	16,036,043	9,202,703	4,277,071	22,926
1891	15,500,084	2,280,291,810	587,988	14,591,178	8,279,870	3,904,240	22,904
1892	14,870,714	2,121,405,594	681,571	16,296,666	9,157,000	4,927,581	27,993
1893	14,346,250	2,034,104,772	941,368	11,587,629	7,124,502	4,019,095	30,164
1894	13,954,400	2,072,469,072	996,949	11,879,679	6,657,888	4,412,032	30,416
1895	13,006,650	2,221,475,892	1,038,551	15,957,614	9,446,308	6,114,534	30,104
1896	13,002,512	2,560,335,162	930,779	16,005,449	8,623,127	5,281,089	30,765
1897	13,826,422	2,539,971,072	1,039,345	17,518,046	9,652,680	7,156,957	26,648
1898	15,296,813	2,325,297,786	1,308,885	19,433,716	11,773,934	8,932,857	31,092
1899	20,074,873	2,396,975,700	1,515,702	24,683,173	13,620,703	10,639,857	30,454
1900	23,698,674	2,672,062,218	1,491,216	27,553,161	13,789,242	10,188,229	28,317
1901	27,066,077	2,914,346,148	1,483,723	28,887,479	15,878,354	13,473,995	26,727
1902	30,867,863	3,728,210,472	1,490,314	35,554,135	17,821,307	14,947,250	34,291
1903	35,807,860	4,219,376,154	1,581,576	35,019,308	18,009,252	14,534,978	35,620
1904	38,496,760	4,917,400,320	1,874,428	27,644,330	16,497,033	13,859,887	34,570
1905	41,562,855	5,658,138,360	1,947,190	42,526,133	22,992,380	20,023,947	30,451
1906	46,873,932	5,312,745,312	2,080,957	47,749,728	25,307,191	23,398,136	26,238
1907	54,222,999	6,976,004,070	2,265,343	51,720,619	25,781,361	23,362,994	21,567
1908	54,640,374	7,498,148,910	2,386,138	35,983,336	15,936,018	14,023,947	19,752
1909	63,206,941	7,649,639,308	2,330,152	51,294,271	25,795,471	23,955,021	21,075
1910					27,298,545		

* Calendar years.
[1] The figures are those of the Bureau of the Census and cover census years.

Law Offices.
Billson, Congdon & Dickinson,
Suite 511, Lonsdale Building.
Duluth, Minnesota.

WILLIAM W. BILLSON
CHESTER A. CONGDON.
DANIEL A. DICKINSON.

Duluth April 23/98

Received of John G. Brown $550 ##
in full of all charges to be made against
him for attorneys fees, costs or disbursements
in proceeding for reduction of rate of freight
about to be commenced in name of Brunswick
Potters against D & I R R Co & D. M.
& N. R R Co.

Billson Congdon & Dickinson

The CHAIRMAN. I have here a receipt covering the amount of money Mr. Brown swore he received from Billson, Congdon & Dickinson, in consideration of being permitted to drop this case.

Mr. YOUNG. Will you not read it?

The CHAIRMAN (reading):

WILLIAM W. BILLSON, CHESTER A. CONGDON, DANIEL A. DICKINSON.

LAW OFFICES, BILLSON, CONGDON & DICKINSON,
SUITE 511, LONSDALE BUILDING, DULUTH, MINN.,
Duluth, April 23, 1898.

Received of John G. Brown, $550, in full of all charges to be made against him for attorneys' fees, costs, or disbursements in proceeding for reduction of ore freights about to be commenced in name of himself and others against D. & I. R. R. R. Co., and D. M. & N. R. R. Co.

BILLSON, CONGDON & DICKINSON.

Mr. YOUNG. Does that say about to be commenced, or commenced?

The CHAIRMAN. About to be commenced.

Mr. REED. What is the date?

The CHAIRMAN. It is dated Duluth, April 23, 1898.

Mr. REED. I have some information, Mr. Chairman, you have asked for. Do you wish to hear from me now?

The CHAIRMAN. Yes.

Mr. REED. You have subpœnaed Mr. J. H. Reed to appear this morning and present a statement showing the total tonnage of freight handled over the docks of the Pittsburgh & Conneaut Dock Co., at Conneaut Harbor, Ohio, for the year 1910, showing particularly the tonnages of ore, coal, and miscellaneous freight for said year.

I have such a statement here. I understand you will not require Mr. Reed's presence before the committee, if we produce the statement.

The statement referred to is in the words and figures following, to wit:

THE PITTSBURGH & CONNEAUT DOCK CO.

CONNEAUT HARBOR, OHIO.

Statement showing tonnages handled during the year ended Dec. 31, 1910.

	Tons.	Tons.
Ore unloaded from vessels		6,309,548
Ore loaded on cars direct from vessels	5,375,275	
Ore loaded on cars from dock	1,066.248	
Total ore loaded on cars		6,441,523
Cement loaded on vessels		18,962
Cargo coal loaded on vessels		616,429
Cargo coke loaded on vessels		204
Steel rails loaded on vessels		21,907
Structural steel loaded on vessels		1,991
Coal sold to vessels for fuel		136,505

The CHAIRMAN. Before you go any further, Mr. Reed, the chairman of the committee desires to say he offers no objection to the insertion in the record of any Government publication, bulletin, or report of any State commission. I have heretofore said I hardly think it pertinent to incorporate in the record newspaper articles, unless they were in the nature of exhibits or explanations of some

testimony; but I offer no objection to the introduction and publishing of "A Decade in United States Steel."

As I understand, that document is published by the Steel Corporation.

Mr. REED. I believe not.

Mr. STERLING. I think it is by Dow, Jones & Co.

Mr. YOUNG. Mr. Farrell was examined as to that. He said they did not have anything to do with it, and that it to some extent criticized the management of the Steel Corporation.

The CHAIRMAN. I understood it was published under their direction.

Mr. YOUNG. No.

The CHAIRMAN. It is published by——

Mr. YOUNG (interposing). It is published by the Wall Street Journal.

The CHAIRMAN. That is, by a newspaper. I will extend the rule to the limit, however, in making no objection to its publication.

Mr. YOUNG. It is very much the same situation as in connection with that article by Mr. Muncie.

The CHAIRMAN. Yes; it is along the line of any publication by a well-known author; if it is not so large as to encumber the record it can very properly go in it.

Mr. YOUNG. This embraces a lot of facts, and gives the prices as to steel stocks and things of that kind, that are very handy.

The CHAIRMAN. All right, Mr. Reed.

Mr. REED. You asked me at one of the hearings two weeks ago to get you the form of contract with jobbers that had been prepared by Mr. Buffington.

Mr. YOUNG. Who?

Mr. REED. Mr. E. J. Buffington, the president of the Illinois Steel Co. That was mentioned in the minutes of the sales managers at their meeting of June 14, 1909. I have that form of contract here.

My information from Mr. Buffington, however, is that it was never executed with these jobbers that are mentioned in it, and that no contract to the same effect was ever executed with any other jobber.

Mr. YOUNG. It was a proposed contract?

Mr. REED. It was a proposed contract that Mr. Buffington mentioned in this meeting of the sales managers, and it was under discussion there. It was mentioned in the minutes, and the chairman asked me to produce the original draft.

Mr. YOUNG. It is really part of the minutes?

Mr. REED. It is part of the minutes of the meeting, but, as a matter of fact, it never went into effect with these jobbers or with any others.

The CHAIRMAN. Can you turn to the minutes, to the entry of the minutes explaining that. It might be well to have it all go into the record together. Read what it says in the minutes.

Mr. MACRAE. It is the one hundred and seventh meeting, June, 1909, relations with jobbers:

Mr. Buffington has prepared a form of contract which is along the lines discussed at our last meeting. It is drawn up tentatively as to Ryerson, but is intended to cover all others as well, and in brief is as follows:

That the jobbers will absolutely give up direct shipments. They will carry no stock but that manufactured by the corporation in its particular lines.

They will carry it on consignment and be allowed a compensation by the corporation for putting it in and taking it out of stock on the sliding scale basis, following out the suggestion that there will be a minimum of $1 and maximum of $2 per ton, based upon prices for the materials. The agreement can be terminated upon 60 days' notice by either party. * * * If cancellation is made there is provision that the jobber, if he so desires, can purchase the stock on hand at that time at the last market price; in other words, if we should serve notice July 1 that we want to terminate it September 1, the price at which the stock can be purchased would be the price for the month of August. If he does not desire to take the stock on this basis, then we are to dispose of it ourselves. Provision is also made that for any material these people may fabricate there will be no allowance whatever.

One hundred twenty-first meeting, August 17, 1910:

The chairman advised that the Carnegie and Illinois companies had served notice on the large jobbers Ryerson and Bourne-Fuller that with the expiration of their present contracts August 23 the policy would be to charge them market prices on all material they buy. The small allowance will be made on the material that actually goes into their warehouses, but nothing whatever will be allowed on anything shipped direct to customers.

One hundred twenty-second meeting, September 2, 1910:

Relations with jobbers. Allowance on tonnage which goes into warehouse of jobbers of $1.50 per ton for handling when the price is 1.40 cents, but if there should be any change, either up or down, it will be a question of conference as to what allowance will be made. On all direct shipments the market price will be charged.

One hundred thirty-third meeting, August 16, 1911:

Relations with jobbers. Mr. Andrews stated he thought we can figure upon the competition of the Pacific Hardware & Steel Co. on the coast. He has had several interviews with Mr. Scott and Mr. Norton, of this company, and they seem to have made up their minds that they are going to cooperate with other people in opposition to us. Mr. Worcester said it is not, of course, the intention in establishing a warehouse there to try to shut out competition—in fact, we want competition—and he believes it would be to our disadvantage to try to take the Pacific Hardware & Steel Co. (and all other large buyers) away from competitors, which will result in making the independent manufacturers hunt the whole coast for business. Personally he thinks there is no more desire on the part of these people to fight us than we have to fight them, but that they look at the matter in a broadminded sort of way and that they will hold prices. At the same time he believes that practically every seller on the coast will at times look to our warehouses for his needs.

That is all there is on that page.

The CHAIRMAN. This can go in.

Mr. REED. Why should that go in? It was never executed.

Mr. YOUNG. It will go in as part of the exhibits.

Mr. MACRAE. I had it as part of an exhibit.

The CHAIRMAN. All of that, Mr. Reed, is illustrative of this alleged tentative agreement. You can hand a copy of that tentative agreement to the stenographer, to be incorporated in the record.

The paper referred to is in the words and figures following, to wit:

Whereas J. T. Ryerson & Son, of Chicago, Ill., hereinafter referred to as party of the second part, has been engaged in the sale of structural material, merchant bar steel and plates, for a long term of years and has established in Chicago large warehouses for storing and shipping such materials and has built up, through its selling organization, a large trade throughout the United States to which said materials are sold, such trade being known as a "jobbers' trade;" and

Whereas it now desires to enter into an agreement with some one manufacturer exclusively to supply its requirements of said materials for this trade; and

Whereas the Illinois Steel Co., of Chicago, Ill., hereinafter referred to as party of the first part, manufactures certain kinds and sizes of these materials, and, through arrangement with the Carnegie Steel Co., of Pittsburgh, Pa., can supply other kinds and sizes of these materials, and is desirous of entering into an agreement with the said second party for supplying the trade of the second party with structural material, merchant bar steel and plates:

Therefore, the following agreement is entered into this ——— day of June, 1908, to wit:

Party of the first part hereby agrees to ship to the warehouses of the second party in Chicago, Ill., such of the above-named materials of such kinds and sizes as are made by the party of the first part or by the Carnegie Steel Co., of Pittsburgh, Pa., as the party of the second part may order from time to time. The said materials so ordered and shipped to be stored in the warehouse of the second party in Chicago, Ill., in an orderly manner, so as to permit of conveniently and accurately taking inventory of said materials at any time.

It is understood and agreed by the parties hereto that at no time during the term of this agreement shall the aggregate stocks of said materials in the said warehouses be greater than the total quantity than twenty thousand (20,000) net tons.

On the first day that this agreement becomes operative and on the first day of each calendar month thereafter during the continuance of this agreement the party of the first part shall stipulate in writing the prices at which it will sell said second party the said materials stored in said warehouses for the ensuing calendar month, and shall stipulate the length of time during which sales and deliveries may be made by the party of the second part from the said stock at the stipulated prices.

On the 15th day of each calendar month succeeding date of this agreement the said second party shall pay to the said first party for all of the said materials shipped by it from said stock at the prices stipulated by the said first party as above provided. Such shipments of said materials from said warehouses by the party of the second part to be paid for in accordance with the weights of said materials as they were shipped from the mills of the said first party or from the mills of the said Carnegie Steel Co. to the said warehouses, and in case said second party elects to cut or shear any of the said materials into different lengths and weights than those in which the said materials were shipped from the said mills, the said second party shall bear the expense of shearing or cutting, including the value of the discarded materials. The said second party shall render an account daily to the said first party of any and all shipments of said materials from the said warehouses. And at any time during the term of this agreement said first party may call for the taking of an inventory of said materials within the said warehouses for the purpose of verifying quantities shipped from the said materials so stored, the said second party hereby agrees to take such inventory when called for in the presence of a representative of the first party and render statement thereof to the first party.

The party of the second part hereby agrees to use its best effort and ability in selling such materials so stored in its warehouses to that class of customers known as "jobbers' trade." And it further agrees that all sales of such materials made by it or through its organization shall be delivered from the said materials in said warehouses; and it is distinctly understood and agreed hereby that no sales of such materials by said second party or by any part of its organization shall be shipped or supplied from any other source than the said materials so stored in said warehouses.

In consideration of the services so rendered by the party of the second part, the party of the first part agrees to pay the party of the second part, when such materials are sold and shipped from the said warehouses by the party of the second part, the following rates of commission:

When the price of merchant bar steel stipulated by the party of the first part, as herein provided, is not lower than $1.38 base per hundred pounds f. o. b. cars Chicago, and the price of structural material and plates stipulated by the party of the first part, as herein provided, is not lower than $1.48 base per hundred pounds f. o. b. cars Chicago, a commission of $1.50 per net ton; and when the price of merchant bar steel stipulated by the first party, as herein provided, is not lower than $1.58 base per hundred pounds f. o. b. cars Chicago, and the price of structural material and plates stipulated by the first party, as herein provided, is not lower than $1.68 base per hundred pounds f. o. b.

cars Chicago, a commission of $2 per net ton. The payment of these commissions to be made by the first party to the second party on the 15th of each month following the date of this agreement for all of the said materials sold and shipped by the second party from the said warehouses during the previous month.

It is further agreed and understood that when the prices or price stipulated by the first party, as herein provided, are or is below $1.38 base for merchant bar steel and $1.48 base for structural material and plates f. o. b. cars Chicago, the first party is to pay the second party no commission or compensation of any kind for selling and shipping such materials from said warehouses.

This agreement to continue in effect until terminated as herein provided. Each party hereto reserves the right to terminate this agreement by giving written notice to the other party 60 days prior to the date of termination.

If and when such notice of termination is given by either party, the second party may, at its option, exercised within 10 days thereafter, by notice in writing to the first party, purchase all of said materials remaining in said warehouses unsold at the date of termination, at the prices stipulated by the party of the first part, as herein provided, on the first day of the month prior to such notice of cancellation. In the event that said second party does not elect to exercise such option of purchase, then at the date of termination the said second party will, at its own expense, load on cars and ship to the first party all of said materials remaining in said warehouses and unsold at the date of the termination of this agreement.

It is further understood and agreed that if said second party desires to use any of the said materials or to have them so used for what is termed fabricating purposes, such materials may be so used, and are to be paid for by the second party at the prices stipulated from time to time by the first party, as herein provided, but no commission or allowance of any kind is to be paid the second party on account of such materials so used.

Mr. YOUNG. Have you ascertained whether any such contracts were executed along this line?

Mr. MACRAE. No; we would have nothing to go by except the minutes, unless we asked the officials, as we have in this instance. He says it was not executed.

Mr. REED. I might add the sentence that follows what Mr. MacRae read from the minutes of the meeting of June 14, 1909. The next sentence following the place where he stopped is:

Altogether it is a very fair arrangement, and one which meets practically all of the views expressed at the last meeting, and Mr. Baker and himself have been asked to go over and dress it up, after which a meeting will be called with the other presidents, and if they are agreeable it is probable that it can be closed within a very short time.

It shows that it was not even then in final form.

Now the chairman has also asked me to procure a copy of the plan for bonuses adopted by the Steel Corporation. I have that here, certified by Mr. Trimble, secretary.

The CHAIRMAN. You can turn that over to the stenographer for insertion in the record.

The paper referred to is in the words and figures following, to wit:

UNITED STATES STEEL CORPORATION, EMPIRE BUILDING, NEW YORK.

OFFICE OF THE SECRETARY.

I, Richard Trimble, secretary of the United States Steel Corporation, do hereby certify that the following is a true and correct extract from the minutes of the finance committee at a meeting held on December 2, 1902:

"Upon motion, duly seconded, and by the affirmative vote of all present, the detailed plan for profit sharing, as submitted by the chairman, and a copy of which is annexed to the minutes of this meeting, was approved."

RICHARD TRIMBLE, *Secretary.*

Seal:

United States Steel Corporation, February, 1901, New Jersey.

To the Board of Directors of the United States Steel Corporation:

GENTLEMEN: The following report and recommendations are made on the question of profit sharing:

At the time of the formation of the Steel Corporation there were various profit-sharing plans in vogue in some of the constituent companies. It did not seem advisable to discontinue these, although some of them were continued temporarily or in modified form.

As the companies have become familiar with the workings of one another the existence of these profit-sharing plans has become known to all, with the result that we have been faced for more than a year with the problem of either abolishing them altogether or adopting a profit-sharing plan that would apply with equal fairness to all the companies.

The question has been canvassed a great deal for more than a year, but not until now have we been able to hit upon a plan that is acceptable to the presidents and other officers of the constituent companies, the officers of the Steel Corporation, and the executive and finance committee.

One of our main difficulties has been to hit upon some plan that would apply with equal fairness to every man, from the president to the man with pick and shovel. Because of the fact that the Steel Corporation is so much in the public eye, we have felt that any profit-sharing plan that did not, in some way, include every employee, would be subject to public criticism. We have felt, too, that there were a number of objects to be accomplished by any plan of this kind.

First. To interest the large number of young and able men in the work of more closely organizing and systematizing the corporation's business, not only in connection with their own local concerns, but the Steel Corporation as a whole.

Second. To interest them in reducing the general expenses of the corporation as well as the local cost of manufacture.

Third. We have felt it important to offer some inducement to these men to remain permanently in the corporation's service.

Fourth. We have felt that a profit-sharing plan that pertained solely to a constitutent company might have a tendency to build up the profits of that company to the possible detriment of the broadest and best interests of the corporation as a whole.

Fifth. We have felt it important to devise a plan by which, in the appropriation of money for improvements and development of plants, Company A, for instance, would be interested in what Company B was doing, and Company B in what Company A was doing, with a view to having, as nearly as possible, an automatic regulator on unnecessary duplication of appropriations.

We realize that the accomplishment of all the above desirable results is expecting a good deal from any one plan, and the plan we recommend may fall short of our expectations; but we have canvassed it very carefully for several weeks; we have had the presidents of all the subsidiary companies here in New York for some days, and have been in daily conference with them over the matter until they are unanimous in their approval of our recommendation, which is as follows:

The corporations in which this corporation is interested have in their employ about 168,000 men. One hundred and twenty-two thousand of these men receive $800 or less per annum. It has, therefore, seemed to us almost impossible to devise any plan by which this large number of laboring men could participate in a profit-sharing plan on a cash basis. We have, therefore, divided our plan into two parts:

PART ONE.

A plan to offer to all employees of the corporation, from the president to the laboring man, an opportunity to buy the corporation's preferred stock in the following manner:

We propose dividing the 168,000 employees into six classes:

Class A.—All those who receive salaries of $20,000 a year and over, and with the readjustment of some salaries and the discontinuance of others there will be not to exceed 15 men in this class.

Class B.—All those who receive from $10,000 to $20,000 a year, of which there will be not to exceed 50 men.

Class C.—All those who receive from $5,000 to $10,000 a year, of which there will be about 150.

Class D.—All those who receive from $2,500 to $5 000 a year, of which there will be about 1,300.

Class E.—All those who receive from $800 to $2,500 a year, of which there will be something over 122,000.

We propose to offer for sale to these employees, as of January 1, 1903, say, 25,000 shares of preferred stock at whatever the finance committee considers a fair market price in December, allowing them to subscribe for as much stock as they choose, not to exceed a sum represented by a certain percentage of their annual salaries, as indicated in the following: Class A, 5 per cent; class B. 8 per cent; class C, 10 per cent; class D, 12 per cent; class E, 15 per cent; class F, 20 per cent.

The stock purchased must be taken in the name of the employee who purchases it, and he must agree to pay for it in monthly payments of such amounts as he may desire, not to exceed 25 per cent of any one month's salary. Dividends on the stock will go to the purchaser from the date he commenced to make payments on account of the purchase. Interest at 5 per cent will be charged on deferred payments on the stock. In case a man discontinues payments before his stock is fully paid, he can withdraw the money he has paid on account of principal.

If the 25,000 shares of stock are oversubscribed, allotments will be made pro rata, but each subscriber will be allotted at least one full share.

A man may take as long as he chooses to pay for his stock, not exceeding three years. As soon as it is fully paid for it will be delivered to him, and he can then sell it at any time he chooses; but as an inducement for him to keep it, to remain continuously in the corporation's employ, and to have more than an ordinary interest in the corporation's welfare, he will be told that if he presents his stock to the treasurer of his company in January of each year, accompanied by a certificate from a proper official to the effect that he has been continuously in the corporation's service during the year and has shown a proper interest in its welfare and progress, he will receive checks at the rate of $4 a share per year for five years. For example, if a man buys one share of this stock in January, 1903, and pays, say, $85 for it, keeps it for five years, and remains in the corporation's employ during the five years, he will have received $20 at the end of that time in the shape of five checks of $4 each. This money will have been paid him for remaining continuously in the corporation's service, for having become a partner through the ownership of stock, and for having presented each year a letter from a proper official showing that he has worked to promote the corporation's best interests.

If the man does not continue for five years, the yearly allowances to which he would have been entitled will be credited to a special fund, interest allowed on this fund at the rate of 5 per cent per annum, and the total amount so accumulated will be divided at the end of five years among such men as buy the stock, keep it for five years, remain in the corporation's employ for five years, and give satisfactory service.

The financial benefit of the above to the man who continues will be that his stock, for which he paid, say, $85 a share, has cost him only $65 a share, which ought to be a safer and more attractive investment than he can find anywhere else for whatever money he can ordinarily save out of his wages or salary; and in addition to this he will receive a dividend, so to speak, of a sum which can not be ascertained in advance from the fund above referred to, made up of the allowance of the various men who do not fulfill the conditions and cease at some time during the five years to be entitled to $4 a year on their stock.

It is believed that this will interest at the very beginning a substantial number of our most thrifty men and that it will gradually interest a good many of them, as it is contemplated saying to the men, when this plan is announced, that if it is successful the corporation intends to make similar offers each year.

If 25,000 shares of stock were sold to the employees during 1903, it would call for a cash outlay of $500,000, distributed over five years.

It is suggested that if any man, while in the employ of the corporation, becomes disabled or dies at any time during the five years, the money which would have been paid him during the five years shall be paid to him or to his estate.

It will be noted that in the above plan we have allowed the workingmen to subscribe for a much larger amount of this stock, in proportion to their incomes, than the officers can subscribe for. This is because we do not feel under so great obligation to allow men with high salaries to buy stock on such advantageous terms. On the other hand, we wish them to have the right to subscribe

for some amount, even though it be small, so that they will be on the same footing as the laboring men; and as the higher salaried men will, of course, be glad to take all the stock they are entitled to, their example to the laboring men ought to be helpful to the plan as a whole.

The above is our plan for selling stock to the employees and interesting a certain number of them in buying it and remaining permanently in the corporation's service. It is intended to embrace the large body of men who have no part in the direct management of the corporation's affairs and are not responsible for results and are not able in any marked degree to affect the cost of manufacture or the net profits as a whole.

Part No. 2, which is a strictly profit-sharing plan, is intended to reach the men who are managing the affairs of the corporation, either at its head office or at the offices of the various subsidiary companies.

PART TWO.

In round figures it requires $75,000,000 to pay the interest on the corporation's bonds, the dividends on its preferred and common stock at the rates now being declared, and to make sinking fund deposits. We have to-day about 55,000 stockholders. These men own the vast properties comprising the Steel Corporation. We believe that they and other possible investors in the corporation's stock would feel a certain sense of security in the earning power of the corporation if they knew that the officers and managing men generally of the entire organization were willing to enter into a contract with the stockholders by which part of their compensation for services rendered was to be paid only after $80,000,000 had been earned. It is suggested, therefore, that there be an adjustment of salaries so that every man in the corporation's employ will feel that he is receiving a fair and reasonable salary for his services, and that over and above that salary he shall have an opportunity to earn each year a substantial sum of money, said sum being based wholly on the success of the United States Steel Corporation as a whole, in the following manner:

If $80,000,000 and less than $90,000,000 is earned during 1903, 1 per cent shall be set aside;

If $90,000,000 and less than $100,000,000 is earned during 1903, 1.2 per cent shall be set aside;

If $100,000,000 and less than $120,000,000 is earned during 1903, 1.4 per cent shall be set aside;

If $110,000,000 and less than $120,000,000 is earned during 1903, 1.6 per cent shall be set aside;

If $120,000,000 and less than $130,000,000 is earned during 1903, 1.8 per cent shall be set aside;

If $130,000,000 and less than $140,000,000 is earned during 1903, 2 per cent shall be set aside;

If $140,000,000 and less than $150,000,000 is earned during 1903, 2¼ per cent shall be set aside;

If $150,000,000 and less than $160,000,000 is earned during 1903, 2½ per cent shall be set aside.

Whatever sum of money is thus set aside during 1903 shall be divided as follows: Twenty-five per cent among the officers and more prominent employees of the United States Steel Corporation at its head office; 25 per cent among the officers and more prominent employees of the subsidiary companies; 50 per cent among such of the men of the subsidiary companies as have it within their power to further the interests of the business in countless ways.

It is suggested that the selection of the men to share in these profits shall be left to the finance committee on the recommendation of the presidents of the subsidiary companies, approved by the proper officers of the United States Steel Corporation. We may not in the first year get an equitable apportionment, but it is not the intention to make permanent the above schedule or the apportionment of the same; simply to announce it now as the program for the year 1903, leaving us free to announce any plan we may desire at the end of 1903 for the year 1904.

Any profits distributed under the above schedule and to the above classes of men will be paid out as follows: For example, if $80,000,000 is earned, then $800,000 would be the sum set aside for distribution during the year 1903. It is proposed to distribute one-half of this sum in cash quarterly during the year; reserve the other half until the end of the year, and then invest it in preferred stock; divide the amount of stock thus purchased, distributing one-

half to the employees who are entitled to it, and holding the other half in the hands of the treasurer of the corporation, giving each man a certificate of his interest, the certificate to recite, among other things:

First. That if he remains continuously in the corporation's service for five years the stock shall be delivered to him and he may do as he likes with it.

Second. That if he dies or becomes totally and permanently disabled while in the employ of the corporation, the stock will be delivered to his estate or to him.

Third. That he can draw the dividends declared on the stock while it is held for his account and he remains in the corporation's employ.

Fourth. That if he voluntarily leaves the corporation's service, without its previous consent, he forfeits all right to this stock, and it will be held in a fund which will be divided at the end of five years among such employees as shall have complied with all the conditions.

Thus 25 per cent of all the money set aside in this profit-sharing plan will be held for five years and only given to such as are in the corporation's employ during 1903 and remain continuously in its employ until January, 1908.

We have canvassed this question very carefully with the managing men of the various subsidiary companies, and we believe that this plan will materially quicken the interest of a large number of our men in the general success of the Steel Corporation and make them feel that they want to remain permanently in its service.

It is believed that if the two plans above outlined are put into proper shape and announced before the beginning of next year it will very materially strengthen and solidify the entire organization; that it will stimulate individual effort all along the line; that it will give us a solid and compact organization, working for one common end, and enable us to get unanimous support on any and all plans looking toward further economies in manufacture and administration, and in this way will do more than anything else could to guarantee a continuance of the corporation's present earning power.

In connection with the above profit-sharing plan it is the intention to announce to the organization that the question of what constitutes profits at the end of a year shall be determined solely by the finance committee, and as the finance committee will have no interest whatsoever in the profit-sharing plan, its rulings must be accepted as fair and impartial to all.

While adjusting this question of profit sharing, the finance committee has endeavored to arrange a more complete and satisfactory method of making appropriations for renewals and improvements to plants during 1903. Up to the present time, if any one of the constituent companies wanted an appropriation for any purpose, the president of the company made his recommendation to the officers of the Steel Corporation, who investigataed it so far as they could, referred it to the executive committee, who considered the matter from every point of view and, if approved by them, passed it on to the finance committee for final action. Now that we hope to interest the president of each subsidiary company in the profits of each of the other subsidiary companies, through a profit-sharing plan of the Steel Corporation as a whole, we believe that one of the very best methods of regulating the expenditure of money on all the plants will be to have the president of each subsidiary company give his opinion as to the advisability of a contemplated improvement or expenditure on any one of the other plants, and it is the intention, therefore, to have a meeting of the presidents of the subsidiary companies regularly, say, once a month, at which meeting all questions of contemplated expenditures or improvements on any plant will be discussed by all the subsidiary presidents, and their recommendations will then go to the officers of the Steel Corporation, the executive and finance committees, for final action.

In the same manner questions of purchasing supplies, of regulating sales, etc., will be taken up at these presidents' meetings and dealt with from the broad point of view of the Steel Corporation as a whole.

In short, the idea is to administer the affairs of the Steel Corporation by committee work, as far as possible, and to impress on everyone in authority the importance of making one plant cooperate with another wherever possible and of advantage to the Steel Corporation as a whole.

By order of the finance committee:

GEO. W. PERKINS, *Chairman.*

NEW YORK, *December 2, 1902.*

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No. 53

(IN FOUR PARTS)

PART I.

UNITED STATES STEEL CORPORATION

HEARINGS

BEFORE THE

COMMITTEE ON INVESTIGATION OF UNITED STATES STEEL CORPORATION

HOUSE OF REPRESENTATIVES

WEDNESDAY, FEBRUARY 28, 1912

WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

REPORT OF

FARQUHAR J. MacRAE

TO CHAIRMAN OF SPECIAL COMMITTEE TO INVESTIGATE VIOLATIONS OF THE ANTITRUST ACT OF 1890 AND OTHER ACTS.

IN FOUR PARTS.

Part I.—REPORTS, ETC.
Part II.—EXTRACTS FROM MINUTES, ETC.
Part III.—DOCUMENTS, ETC.
Part IV.—INDEX.

UNITED STATES STEEL CORPORATION.

COMMITTEE ON INVESTIGATION OF THE
UNITED STATES STEEL CORPORATION,
HOUSE OF REPRESENTATIVES,
Washington, D. C., February 28, 1912.

The committee this day met, Hon. Augustus O. Stanley (chairman) presiding.

STATEMENT OF F. J. MacRAE.

The witness was sworn by the chairman.

The CHAIRMAN. You may proceed now, Mr. MacRae.

Mr. MACRAE. I have the honor to transmit herewith the results of my investigation to this date of accounts, documents, and papers submitted to me by the United States Steel Corporation in accordance with the authority vested in me under the resolution adopted by the committee.

This report is in three sections:

Section 1: The accounts dealing with the earnings of the corporation since its formation.

Section 2: Exhibits submitted by the United States Steel Corporation in response to requests made by me; Extracts from the minutes of the United States Steel Corporation and subsidiary companies; Extracts from previous reports made by me to the committee.

Section 3: A summary of all the evidence extracted from the minute books and exhibits, etc., and from the testimony taken by the committee, up to the completion of the said summary, with which is combined an index in three parts, showing (1) the subjects included in the inquiry, (2) the companies and firms, and (3) the individuals investigated and referred to in the testimony, etc., together with a brief of such evidence.

SECTION 1—ACCOUNTS.

On or about September 1, 1911, the United States Steel Corporation submitted to me printed copies of the published reports of the corporation for the years 1902 to 1910, inclusive, also the preliminary report to the stockholders for the period from April 1, 1901, to December 31, 1901 (nine months), and the profit and loss statements of

the subsidiary companies of the United States Steel Corporation, together with a general profit and loss statement of the United States Steel Corporation and the Federal Steel Co., as holding companies, for nine years, 1902 to 1910, inclusive. These statements were accepted by me, and I am satisfied correctly show in a summary form the transactions of the several companies up to the point of net earnings.

It would naturally be assumed that the summary income accounts for each year, 1902 to 1910, inclusive, compiled from the several subsidiary companies' profit and loss statements, would result in a general profit and loss or income account of the United States Steel Corporation and its subsidiary companies for the period under examination.

This was the task undertaken from the data furnished me, and resulted in the compilation of summary yearly profit and loss accounts, which statements, however, did not agree with the annual published reports of the United States Steel Corporation, except as to total net earnings, all other items to wit: Total gross sales and earnings, administrative and general expenses, other income, interest charges, gains and losses, having been adjusted internally by the United States Steel Corporation before arriving at the figures shown in the published reports.

On or about December 1, 1911, I took up with the officials of the United States Steel Corporation the question of these apparent large discrepancies between the figures compiled by me and those submitted by the corporation in their annual reports, and on December 12, 1911, I received from the corporation the summaries of general profit and loss accounts of all the companies for the period from January 1, 1902, to December 31, 1910 (nine years), showing the inter-company adjustments, which summaries, condensed and rearranged, are submitted herewith. (Exhibits Nos. 1 to 9, inclusive.) With these summaries was handed to me the following explanatory memorandum, which I quote in full:

> These summaries cover a cumulation, according to the respective groups, of the profit and loss figures shown by the various subsidiary companies' statements of general profit and loss. They also take up the eliminations and adjustments made for the purpose of reducing the final aggregate results on the basis of a consolidated unit proposition, so far as the same is possible and practicable. It is on this last-named basis that the figures shown in the annual report in the table of general profit and loss are stated. It will be noticed that the final aggregates, so far as gross figures are concerned, as shown in the attached summaries, differ in some particulars from similar aggregates printed in the annual reports for the respective years, although in every case the final net earnings as shown by these statements conform to those printed in the annual report * * *.
>
> The differences in the aggregate of gross figures as above referred to result from a different grouping or classifying of items of receipts and expenditures

as worked into these final summaries in comparison with the manner originally taken up in the preparation of the summaries which were printed in the annual reports. The greater portion of the differences is attributable to the fact that in reabstracting the statistics in the compilation of these summaries (all of which work was taken up and done at some considerable time after the annual report statement was gotten out), there was adhered to certain well-defined regulations and principles of classification which seemed to best illustrate the operations. As before stated, the net earnings agree with the final net as reported in the annual reports, and this is the essential feature. These summaries represent our best and most careful efforts to classify all items uniformly in the several companies, in the different years, and in accordance with the facts. The result as to net earnings agrees, and that is the test to be applied.

In order to explain the sources of the data presented in the summaries above referred to, the following explanation should be made: The subsidiary companies keep their own sets of books just as if they were not controlled by the Steel Corporation as a holding company. Each subsidiary company's books show its sales or turnover and its profits. The books of the Steel Corporation as a holding company do not show this data contained in the books of the subsidiary companies, but merely show its own operations, to wit, its income in the shape of dividends upon the stocks of the subsidiary companies and interest upon the bonds of the Carnegie Co., together with certain other miscellaneous income, and its outgo for interest on its bonds, dividends on its stock, administration, and other charges. These summaries are prepared upon separate sheets from the figures compiled from the books of the various subsidiary companies and the Steel Corporation; or, as it is explained above, " cover a cumulation according to the respective groups of the profit and loss figures shown by the various subsidiary companies' statements of general profit and loss, etc." These summary sheets of the operations of the subsidiary companies are combined with the results shown on the books of the holding company in the form shown in the annual reports, substituting the capital stock and bonded indebtedness of the United States Steel Corporation for the capital stock and bonded indebtedness of the various subsidiary companies and property account to balance.

As a result of my examination of the books, papers, and documents of the United States Steel Corporation, submitted to me, I have prepared the following statements of account or Exhibits Nos. 1 to 27, to wit:

And here is the book containing those exhibits. I will identify them in the report as I go on.

I may explain that under the form of receipt that I signed, which you will all remember in my letter of December 4 was explained, I could not particularize or specify any company. So in making up these statements I grouped them.

The CHAIRMAN. These papers were furnished only upon condition that you would not particularize?

Mr. MACRAE. Yes; or specify. So I grouped them into manufacturing companies, coal and coke companies, iron mining companies, transportation companies, and miscellaneous companies, which for the purpose of the report I think is all right, and will still fulfill the obligation of the receipt I signed.

Mr. REED. Of course the restriction was withdrawn——

Mr. MACRAE. I had this finished before the restriction was withdrawn.

Exhibit 1 is a statement made of all the companies for the year 1902, divided in that manner. It shows the gross sales and earnings, the operating charges, the net operating charges, the total operating charges, the total income before interest charges, total earnings less bond sinking fund, depreciation, net earnings before deducting bonus funds, and net earnings.

The exhibit will speak for itself, if the gentlemen will examine it.

Exhibit No. 2 is a similar statement for the year 1903.

Exhibit No. 3 is a similar statement for the year 1904.

Exhibit No. 4 is a similar statement for the year 1905.

Exhibit No. 5 is a similar statement for the year 1906.

Exhibit No. 6 is a similar statement for the year 1907.

Exhibit No. 7 is a similar statement for the year 1908.

Exhibit No. 8 is a similar statement for the year 1909.

And Exhibit No. 9 is a similar statement for the year 1910.

In other words, one statement is the same as another, except that each covers a separate year, being divided into groups, as I say, and showing the operations of the company practically in the same manner in which they are in the annual report, except as to splitting up between transportation, coal and coke, iron mining, manufacturing, and miscellaneous companies.

Mr. YOUNG. As I understood you, you say that the final result as to the earnings agrees with their published report.

Mr. MACRAE. No; the final net result, according to the group, agrees with the annual report.

In my report here I have made certain adjustments which increase those net earnings. I will come to that later.

Exhibit No. 10 is a summary of the general profit and loss account for the nine years ended December 31, 1910, for the manufacturing companies.

In other words, after this step was taken we took the manufacturing companies out, the coal and coke companies out, the water companies out, and put them together so as to show the manufacturing companies for the whole nine years, the coal and coke companies for nine years, the iron-mining companies for nine years, the transportation companies for nine years, and the miscellaneous companies for nine years, taking in exhibits numbered from 10 to 14, inclusive.

Exhibit No. 15 covers the United States Steel Corporation and the Federal Steel Co.

Exhibit No. 16 is a statement of all of the companies combined, taking one grand total, which gives you the general result for the nine years, with each group by itself.

Exhibit No. 17 is a detailed summary of depreciation, extinguishments, and replacement funds, and so forth, for the nine years ended December 31, 1910. That is a compilation on one sheet of paper, showing all the money they spent in that manner.

Exhibit No. 18 is a statement of the United States Steel Corporation and the Federal Steel Co., general profit and loss account, from April 1, 1901, to December 31, 1910. That is a statement of the income of the Steel Corporation as a holding company and its expenses, its dividends, and interest on its bonds, which was taken from the books of the United States Steel Corporation as a holding company and not from sheets of paper.

Exhibit No. 19 is a summary of the surplus accounts of the United States Steel Corporation and its subsidiary companies from April 1, 1901, to December 31, 1910—a reconciliation account.

Exhibit No. 20 is a consolidated general balance sheet as of December 31, 1910.

Exhibit No. 21 is a surplus account of the United States Steel Corporation and its subsidiary companies, April 1, 1901, to December 31, 1910.

Exhibit No. 22 is a surplus account of the United States Steel Corporation and its subsidiary companies from April 1, 1901, to December 31, 1910—a summary.

Exhibit No. 23 is the property account from April 1, 1901, to December 31, 1910.

Exhibit No. 24 shows the ordinary expenditures for maintenance and repairs for nine years ended December 31, 1910.

Exhibit No. 25 shows the adjusted net earnings from April 1, 1901, to December 31, 1910.

Exhibit No. 26 shows, or is a statement showing, the disposition of adjusted net earning from April 1, 1901, to December 31, 1910.

Exhibit No. 27 is a comparison of securities issued by the United States Steel Corporation in 1901 with the amounts of securities of constituent concerns and cash acquired therefor.

The CHAIRMAN. Right there I want to ask a question. You spoke of interchange of securities, the securities of these various companies for the securities of the United States Steel Corporation.

Mr. MACRAE. Yes, sir.

The CHAIRMAN. What became of the securities of those companies?

Mr. MACRAE. The United States Steel Corporation property consists of the stocks of the subsidiary companies that they own, plus

the bonds of the Carnegie Co., and my understanding is they are placed with the United States Trust Co. as trustee, and they have those stocks and those bonds.

Mr. REED. That is correct.

The CHAIRMAN. They are the basis upon which these new stocks and bonds——

Mr. MACRAE (interrupting). Yes; that is the basis for which the Steel Corporation preferred and common stocks and bonds are issued and the $25,000,000 cash.

This table is practically furnished by the Steel Corporation to me. I had it, but it had already been prepared; so I have the same table Mr. Knox Smith has.

Form of accounts.—The summary general profit and loss accounts of all companies for the several years, 1902 to 1910, inclusive, Exhibits 1 to 9, is constant, showing the total transactions of all companies for each year respectively, grouped as to the transactions of:

(*a*) Manufacturing companies, including the American Bridge Co. of New Jersey.

(*b*) Coal and coke companies.

(*c*) Iron-mining companies.

(*d*) Transportation companies.

(*e*) Miscellaneous companies.

(*f*) United States Steel Corporation and Federal Steel Co. (as holding companies).

The figures contained in these groups are recapitulated under each head for the nine years, 1902 to 1910, in Exhibits 10 to 15, inclusive, which figures are again summarized in one grand total of all companies combined for the nine years in Exhibit No. 16.

Column 1 of Exhibit 16 shows the grand net total of the aggregate transactions of all the companies for the nine years ended December 31, 1910, after giving effect to deductions for the "Elimination of inter-company interests and adjustments of other accounts" in column 2.

Columns 3, 4, 5, 6, 7, and 8 show the grand gross totals of the aggregate transactions of all companies for the nine years ended December 31, 1910, for the groups named before taking into account inter-company adjustments.

It is impossible for me to allocate the inter-company adjustments between the groups named for all the nine years, and it is stated that the corporation can not supply the information prior to the year 1905.

The total gross sales and earnings of all companies combined for the nine years ended December 31, 1910, amounted to $5,424,631,046.14, of which the sales to outside customers amounted to $3,569,629,995.97, and the sales to subsidiary companies amounted to $1,418,-

988,132.78 (the balance being earnings of transportation and miscellaneous companies, etc.); and the net earnings for the same period, as shown by the corporation, amounted to $905,039,607.77 (Exhibit 16).

The net operating charges for this period, or, in other words, the manufacturing and producing cost of products sold, exclusive of extinguishment funds and depreciations and replacement funds charged through operating costs, amounted for the nine years to $4,087,667,271.90, in which amount the corporation has included charges for ordinary maintenance and repairs amounting to $252,178,582.34, which amount is shown in detail in Exhibit 24, submitted herewith.

Other charges against net earnings, as shown in column 1 of Exhibit 16, are self-explanatory under the headings shown, to wit: "Administrative, selling and general expenses;" "taxes;" "sundry manufacturing and operating gains and losses;" "interest charges, etc."

It must be noted that the corporation, in addition to the item $252,178,582.34 charged for ordinary maintenance and repairs, has set aside during the nine years for depreciation, replacement funds, etc., the sum of $211,613,963.17, a detailed summary of which is shown in Exhibit 17.

The United States Steel Corporation is a holding company receiving its revenues from dividends on the capital stock of its subsidiary companies owned by it, and, in the case of the Carnegie Co., interest received on the collateral trust bonds owned by it, together with certain other miscellaneous income. The details of this income are shown in the general profit and loss account of the United States Steel Corporation, including the Federal Steel Co., on the credit side of Exhibit 18. The charges against this revenue are also detailed in Exhibit 18. This general profit and loss account from April 1, 1901, to December 31, 1910—nine years and nine months—has been prepared directly from the books of the corporation and not from the summaries referred to above. It will be seen from this account that out of the total dividends received by the United States Steel Corporation from its subsidiary companies, plus the interest on the Carnegie bonds, making a total of $753,124,386.53 for the period of nine years and nine months, the income from the Carnegie Co. in dividends and bond interest amounted to $305,239,537.49, or about 40 per cent of the total. The American Bridge Co. paid the holding company dividends on its preferred stock during this period to the amount of $19,715,577.50, or 2.6 per cent of the total.

A condensed statement of the dividends paid by the subsidiary companies to the United States Steel Corporation and the interest paid

by the Carnegie Co. on its collateral trust bonds from April 1, 1901, to April 1, 1910, is as follows:

The Carnegie Co	$227,280,000.00
Federal Steel Co., common	114,816,182.00
Federal Steel Co., preferred	31,157,128.50
National Tube Co., common	29,783,905.50
National Tube Co., preferred	27,299,737.50
American Steel & Wire Co. of New Jersey, common	51,110,460.25
American Steel & Wire Co. of New Jersey, preferred	27,299,158.25
National Steel Co., common	6,400,000.00
National Steel Co., preferred	3,779,158.00
American Tin Plate Co., common	7,419,690.00
American Tin Plate Co., preferred	3,634,372.00
American Sheet Steel Co., common	3,184,948.00
American Sheet Steel Co., preferred	5,573,568.00
American Sheet & Tin Plate Co., common	25,540,833.00
American Sheet & Tin Plate Co., preferred	12,004,804.00
American Steel Hoop Co., common	1,330,000.00
American Steel Hoop Co., preferred	2,041,497.51
American Bridge Co., preferred	19,715,577.50
Oliver Iron Mining Co	2,400,000.00
Lake Superior Consolidated Iron Mining Co	66,689,969.03
Shelby Steel Tube Co., preferred	2,224,995.00
Pittsburgh Steamship Co	243,870.00
Clairton Steel Co	4,235,000.00
	675,164,849.04
Interest on the Carnegie Co., collateral trust bonds	77,959,537.49
	753,124,386.53

APRIL 1 TO DECEMBER 31, 1901.

The account submitted herewith, so far as Exhibits 1 to 16 are concerned, do not include any detailed statements of the operations of the corporation for the period nine months from April 1 to December 31, 1901. It is stated that detailed information of the operations for this period before arriving at net earnings can not be produced owing to the fact that actual figures are not available. I have therefore included figures for 1901 (nine months), beginning with net earnings amounting to $74,960,704.21. These net earnings, for the purpose of preparing reconciliation of the accounts, appear for the first time in the "Surplus account of the United States Steel Corporation and its subsidiary companies, Exhibit 20;" whereas Exhibit 16 shows net earnings from January 1, 1902, to December 31, 1910, of $905,039,607.77. The net earnings for the nine months ending December 31, 1901, added thereto, make the total net earnings for the period of nine years and nine months $980,000,311.98, and summary surplus account. Exhibit 20 shows the undivided balance to the credit of surplus at December 31, 1910, of $164,143,157.99, which amount I have verified and found to be correct.

The total net earnings for the entire period from April 1, 1901, to December 31, 1910 (nine years and nine months), as shown by the United States Steel Corporation, amount to $980,000,311.98. Included in the operating charges, before arriving at net earnings, the corporation has figured consistently each year certain amounts, which in my opinion should not have been charged against net earnings and which items I have restored to net earnings for the purpose of these accounts. In other words, I have adjusted the net earnings as shown by the corporation from $980,000,311.98 to $1,109,146,093.49.

Mr. GARDNER. How does that correspond with the difference that Herbert Knox Smith added?

Mr. MACRAE. I have added $15,401,517.45 on subsidiary company bonds that Mr. Smith did not add.

Mr. GARDNER. I meant in amount.

Mr. MACRAE. Mine is about $9,000,000 more than his.

Mr. GARDNER. He had about $120,000,000.

Mr. MACRAE. I have exceeded him. I have added $15,401,517.45 of subsidiary company bonds that he left out, and I have added the employees' bonus funds, amounting to $24,000,000, and I have added $7,667,059.39 that was charged up to construction, and against that he has deducted excessive valuation of properties and I have not touched that at all because I did not revalue the property. The net difference is about $9,000,000 between him and me.

Mr. REED. Mr. Smith's estimate of that period is reduced by his deducting those items to $1,100,350,857.

Mr. MACRAE. $8,000,000 difference made up in the manner that I have just described.

The amounts restored to net earnings are shown in detail for each year in Exhibit 25. These include sinking fund on bonds of subsidiary companies, the locked up inter-company profits in inventories, special depreciation, admittedly charged to construction; employees' bonus funds and special compensations, account preferred stock subscriptions, which have been treated as dividends from earnings and not in the nature of additional wages to employees; and lastly interest on bonds, mortgages, and purchase money obligations of subsidiary companies.

Exhibit 26 has been prepared for the purpose of showing the disposition made by the United States Steel Corporation of these adjusted net earnings covering the period of nine years and nine months ended December 31, 1910.

During the nine years from January 1, 1902, to December 31, 1910, the production of the subsidiary companies of the corporation in rolled and other finished steel amounted to 79,267,363 tons and the adjusted net earnings for the same period, nine years, amounted to $1,029,685,389.28 or an equivalent of approximately $13 per ton. In

order that an idea may be had of the net earnings in dollars per ton of the several operating groups of the corporation, I have calculated these figures and I find the approximate net earnings of $13 per ton of finished product to have been earned as follows:

	Per cent.	Per ton.
Amount earned by manufacturing companies, approximately	61.63	$8.01
Amount earned per ton by coal and coke companies, approximately	5.42	.70
Amount earned per ton by iron mining companies, approximately	16.29	2.12
Amount earned per ton by transportation companies, approximately	13.92	1.81
Amount earned per ton by miscellaneous companies, approximately	2.74	.36
	100.00	13.00

Taking the adjusted net earnings for the nine years ended December 31, 1910, at $1,029,685,389.28, it will be found that the percentage of the net earnings to sales to outside customers for this period amounts approximately to 29 per cent. Twenty-nine per cent on selling price is equivalent to 40 per cent on cost.

Mr. YOUNG. May I ask a question right there?

Mr. MACRAE. Yes, sir.

Mr. YOUNG. You have given the tonnage of rolled and other finished products. Does the Steel Corporation sell any of its product in the cruder form?

Mr. MACRAE. They sell billets to some people, I believe, but they do not sell pig iron; in fact, they buy pig iron themselves, and their operations, so far as I have been able to understand, is to produce only what they sell, and my understanding of the operations of the Steel Corporation is that they mine the ore and transport it and put it in the blast furnace and make pig iron, and it goes into various other higher forms of finished steel, resulting ultimately in the sale of roughly 10,000,000 tons of finished products per annum to the public, and that is the result of all their operations, and that is the final thing.

Mr. YOUNG. You did not make any investigation as to what the tonnage was of these crude products that they actually sold?

Mr. MACRAE. No. The annual reports of the company show in detail a lot of things in relation to that, and I simply took the final figures as to the finished products. The finished material sold to the outside public I used as the basis, and that is practically what they do. I think Mr. Andrew Carnegie practically did the same thing I did, although I had this calculation made before I had the pleasure of reading his testimony before the Ways and Means Committee.

Mr. STERLING. You mean they produce just the pig iron they use?

Mr. MACRAE. They do not sell pig iron. They use their own pig iron. They not alone consume most all of what they make, but they buy in the outside market.

Mr. ERNEST. Mr. Gary testified they did not sell billets, in volume 5, page 225, of the testimony. But I suppose he excepted certain contracts, like those with the Crucible and Oliver concerns.

Mr. REED. You do not mean the corporation's annual reports have been misleading in leaving out or making these deductions from earnings which you do not make?

Mr. MACRAE. Oh, no; I do not say they are misleading. The net earnings are all right, but when we are trying to arrive at what a manufacturing company makes we are bound to put by the interest on bonds the same as borrowed money, because if they had capital enough they would not have to borrow money, either on bonds or anything else; that is a principle Mr. Filbert will agree with.

Mr. FILBERT. But the annual reports specifically say these amounts deducted——

Mr. MACRAE (interrupting). Oh, there is no attempt to deceive. I do not believe anybody expressed such a thought—that this statement has any such intention in that matter.

The CHAIRMAN. Has the Steel Corporation any set of books showing that——

Mr. MACRAE. They have abstracts from the books. Each subcompany keeps its own set of books, and at the end of the year or other specific times these companies send their accounts in and a statement is made up from all those accounts, putting them all together, and they are made into one statement. You could not go and say "Give me this specific information from the books of the Steel Corporation," because they have to get it in detail from these subcompanies.

Mr. GARDNER. The prime purpose of this division in your report is to show what their actual earnings are?

Mr. MACRAE. Yes.

Mr. GARDNER. In contradistinction to their calculation of their earnings, and that amounts to a difference of $129,000,000?

Mr. MACRAE. Yes.

Mr. GARDNER. Mr. Herbert Knox Smith estimated the amount that ought to be added to their earnings, to show the true earnings, to be $120,000,000?

Mr. MACRAE. Yes.

Mr. GARDNER. If there is any way it can be arranged, Mr. Chairman, I would like to have a joint debate here to get as much as we can through our minds as to whether Mr. MacRae's and Mr. Herbert Knox Smith's methods of calculation are correct, or whether the Steel Corporation's methods are correct. I can not suppose that they adopted that method of bookkeeping to deceive the public.

Mr. MACRAE. Oh, no.

Mr. GARDNER. There must be a difference of principle involved as to what is and what is not true earnings.

Mr. YOUNG. For instance, you say the bonuses amount to how many million dollars?

Mr. MACRAE. $24,000,000.

Mr. YOUNG. And the Steel Corporation treats that as part of its wage account?

Mr. MACRAE. And Herbert Knox Smith says, while he is in doubt about it, he will let it go, and I treated it as a dividend because every employee does not get part of that bonus; and if you wanted to compare with another steel corporation, you could not do it; you could not compare with a concern that did not have that bonus fund. You could not make any comparison. Mr. Smith, in his written text, says he has doubts as to whether it is proper to charge it against earnings, but inasmuch as it was there he left it in, and I took it out.

Mr. YOUNG. That is $24,000,000?

Mr. MACRAE. $24,000,000; yes.

Mr. GARDNER. What are the other big items?

Mr. MACRAE. I have restored interest on bonds of subsidiary companies amounting to $15,401,517.45.

Mr. YOUNG. Is that interest paid by these subsidiaries?

Mr. MACRAE. Yes; that is interest on bonds of the subsidiary companies for 10 years.

Mr. REED. That is bonds held by outsiders.

Mr. MACRAE. Mr. Smith did not add that.

Mr. FILBERT. Yes, he did.

Mr. MACRAE. No; he added $65,000,000.

Mr. GARDNER. Does the Steel Corporation dispute the accuracy of that?

Mr. REED. That is interest that the subsidiary companies pay to outsiders who own bonds of those subsidiary companies. We think it is just as much a charge against earnings as interest on notes which the bank may hold.

Mr. GARDNER. What have you to say to that, Mr. MacRae?

Mr. REED. It is simply a difference of opinion between ourselves and Mr. MacRae.

Mr. MACRAE. I do not believe any accountant will dispute——

Mr. FILBERT (interrupting). Our report shows it both ways.

Mr. MACRAE. We have an item of interest on bonds, mortgages, and purchase-money obligations of subsidiary companies, $65,443,782.06. I have restored it to earnings, and Smith agrees with me in that principle, and he restores $66,000,000.

Mr. YOUNG. What is the difference between that item and this $15,000,000 item?

Mr. MACRAE. In addition to that, I have restored $15,000,000 that comes in under another head, which Smith has not restored.

Mr. YOUNG. I understood both of those are interest on bonds of the subsidiary companies.

Mr. MACRAE. Let us call it interest on bonds. It is not a proper charge——

Mr. YOUNG (interposing). I am not discussing whether it ought to be a charge or not; I want to find out just what it is. Are there two items of interest on bonds?

Mr. MACRAE. There are two items. I think I can explain it in this way. The $15,000,000 item is paid by the subcompanies themselves, and comes in their accounts.

Mr. FILBERT. To the corporation?

Mr. MACRAE. No; to outsiders. It is there because I could not have put it there if it was not there. In addition to that, the $65,000,000——

Mr. YOUNG (interposing). What is the $65,000,000?

Mr. MACRAE. Interest on bonds and mortgages and purchase-money obligations.

Mr. YOUNG. To whom is that paid?

Mr. MACRAE. Outsiders or whoever hold these bonds and mortgages. There is $80,000,000 in that way.

Mr. GARDNER. Who is the gentleman at your right, Mr. Reed?

Mr. REED. Mr. Filbert, comptroller of the Steel Corporation.

Mr. GARDNER. What have you to say as to that, Mr. Filbert.

Mr. FILBERT. I do not know what his $15,000,000 is. I can not believe it is right. Mr. Herbert Knox Smith's figures are right, because we gave them to him and I know they are right.

Mr. MACRAE. And I made these figures up myself, and I know they are right.

The CHAIRMAN. I think you had better be sworn, Mr. Filbert.

(Thereupon the chairman administered the oath to Mr. William J. Filbert, comptroller of the United States Steel Corporation.)

Mr. GARDNER. I think that briefly we ought to pick out the big items in this $129,000,000 of difference, leaving out the small ones and taking only the larger ones, and have Mr. Filbert state why he thinks they ought not to be included in the earnings, and then have Mr. MacRae state why he thinks they should be included.

Mr. YOUNG. Would it not be more orderly to let Mr. MacRae get through?

Mr. MACRAE. I should like to present this report; yes.

Mr. YOUNG. We will get in great confusion if we let both of these men talk together. Mr. Filbert is listening to Mr. MacRae.

Mr. MACRAE. Mr. Smith has the $65,000,000, but not the $15,000,000.

Mr. YOUNG. What is the distinction between the two?

Mr. MACRAE. The only distinction I know of is that they split it themselves in their reports.

Mr. YOUNG. According to your idea, it should not be split?

Mr. MACRAE. My idea of it is that some of these companies pay this money out in their accounts before they get to the Steel Corporation.

Mr. FILBERT. The only thing I can think of is that it may be what may be termed intercompany interest paid by one company to another. That being the case, Mr. MacRae ought not to add it back unless he takes it out where the other companies put it in, when he is making a combined statement. I do not know what his statement is.

Mr. MACRAE. We agree on the $65,000,000.

Mr. YOUNG. That is interest on obligations of the subsidiary companies?

Mr. MACRAE. Yes; and also it should be restored in a compilation of this kind. It is interest on bonds, mortgages, and purchase-money obligations of subsidiary companies.

Mr. YOUNG. That is, interest they pay to the owners of these bonds?

Mr. MACRAE. Yes. Mr. Smith has that in his report, too.

Mr. GARDNER. Mr. Filbert says these figures are correct themselves, but does he also say they ought to be restored to the earnings?

Mr. FILBERT. In order to ascertain the amount of profit on the entire investment; yes, sir.

Mr. GARDNER. That is, that $65,000,000 out of the $129,000,000 which is now out of dispute.

Mr. REED. That is not what Mr. Filbert means.

Mr. FILBERT. I concede that $65,000,000 should be added back to the item of net earnings, as specified and set forth in the corporation's annual report, in order to arrive at a figure which will represent profit earned upon the entire investment in the property as represented both by the capital stock and the bonds of the subsidiary companies; in other words, the entire capitalization of the organization.

Mr. YOUNG. But this does not belong to the Steel Corporation. You have to use these bonds as part of the capital.

Mr. FILBERT. You certainly have.

Mr. BARTLETT. The bonds as part of the capital?

Mr. FILBERT. You add those back and add the total with the total amount of the stocks and bonds of the Steel Corporation per se.

Mr. BARTLETT. The Steel Corporation is eventually liable for those obligations?

Mr. REED. The stock they hold is postponed, of course, to these liens which the subsidiary companies have issued.

Mr. BARTLETT. In the organization of the steel company, did they not assume the liability of these bonds of the subsidiary companies?

Mr. REED. No, sir.

Mr. YOUNG. That is the first charge on the property before the Steel Corporation would have anything.

Mr. GARDNER. Let me understand if this is your contention——

Mr. REED (interrupting). The stocks which the Steel Corporation own represent the equity after these outstanding bonds. Mr. Carnegie owns bonds of the Steel Corporation which are secured by pledge of our stocks or our equity, in other words.

The CHAIRMAN. In the event that the bonds of these subsidiary companies were foreclosed, and the subsidiary companies' property did not pay more than those bonds, there would be nothing left to the Steel Corporation?

Mr. REED. Except in the case of the Carnegie Co. where the steel company owns all the bonds.

Mr. GARDNER. Let me see if I can state your contention correctly, Mr. Filbert: That the Steel Corporation has certain stocks and bonds which represent the total value of their property; that outsiders have certain stocks and bonds which are not included in the assets of the Steel Corporation as estimated by Mr. Herbert Knox Smith; that if you are to add income on those stocks and bonds of outsiders to the income on the stocks and bonds of the United States Steel Corporation, then in calculating your percentage of profit you must also add the stocks and bonds of the outsiders to the stocks and bonds held by the United States Steel Corporation?

Mr. FILBERT. That is quite correct, with one exception; you mention that Mr. Smith, in estimating the value of the property, estimated the values exclusive of that represented by the bonds of the companies held by outsiders. He included in his estimate of value the amount of value so represented by those outside bonds. His value was the gross value, the value of the property represented by both the stocks owned by the Steel Corporation and the bonds held by outsiders.

Mr. GARDNER. But did he, in estimating his percentages, calculate not only the stocks and bonds—did he add to the stocks and bonds of the Steel Corporation the value of the stocks and bonds which were not held by the Steel Corporation?

Mr. FILBERT. He did; although if you will allow me, Mr. Gardner, he did not take the par of the stocks and bonds held by the Steel Corporation as the basis of value. He took his own estimate of the value of the physical properties.

Mr. GARDNER. But did he add that value of the physical property?

Mr. FILBERT. Yes, sir; his figure comprehended the value represented by the bonds of underlying companies which are held by the public.

Mr. GARDNER. Then, why is not his method and Mr. MacRae's a true way of arriving at what the true income was from the total property?

Mr. FILBERT. I think that is exactly in accordance with my statement, that it was, and that I granted the accuracy of Mr. MacRae's adding back the $65,000,000, and also Mr. Smith doing it.

Mr. GARDNER. That is the soundness of their reasoning?

Mr. FILBERT. Both are correct with respect to that item.

Mr. YOUNG. That would be dependent on their also adding the value of the bonds?

Mr. FILBERT. Which they do. Mr. Smith does.

Mr. MACRAE. I did not revalue the property like he did.

Mr. REED. You have not made up a new capitalization?

Mr. MACRAE. No.

Mr. MCGILLICUDDY. Mr. Chairman, will we not get at this matter better if we have this report presented to the committee and printed, so the committee may look it all over, so the attorneys on the other side may look it all over, and then let us have Mr. MacRae come in here and, having digested this whole matter, let us go over it together then. Would we not get at it more intelligently and directly than we can in this way?

The CHAIRMAN. Mr. MacRae, will you be good enough to come back here and appear before the committee, to answer such questions as we may have to propound, after this report is printed and examined by the members of the committee?

Mr. MACRAE. I shall be very glad to do that at any time, Mr. Chairman.

Mr. REED. It is a little difficult to expect Mr. Filbert to criticize a report of this length that he has not heard read or seen.

Mr. MACRAE. I do not think there will be any point of difference between Mr. Filbert and myself on this report, except possibly as to that item of $15,000,000 and the employees' bonus fund, which I have restored. It is a matter of opinion.

The CHAIRMAN. Do you make that as a motion, Mr. McGillicuddy?

Mr. MCGILLICUDDY. I will; yes, sir.

Mr. MACRAE. Mr. Filbert and I agree on this whole thing, with the exception of the $15,000,000.

Mr. FILBERT. And I do not know what that is. The table Mr. Smith has was made up by me, however.

Mr. MACRAE. The table Mr. Smith has was made up by Mr. Filbert, and this table I made up myself.

The CHAIRMAN. The only thing I care to say is this: These discussions are going into the record and they are to be read and should be right. I believe we will get a more accurate record of these differences between the comptroller of the Steel Corporation and the witness and Mr. Herbert Knox Smith—and I think it would be a good idea to have Mr. Smith appear before the committee, too—if it is

done after the Steel Corporation accountant has had an opportunity to examine Mr. MacRae's report.

Mr. REED. The differences are not differences of fact. They are differences of opinion, and when once the witnesses have agreed on the statements, as they now do to a very great extent, then they can explain the reason for the differences of opinion.

Mr. GARDNER. They can frame the issue, then.

Mr. REED. Yes, sir.

The CHAIRMAN. It will save the time of the committee, and if there is no objection it will be so ordered.

The stenographer will incorporate in the record the remainder of Mr. MacRae's statement of transmittal of these reports and exhibits.

The committee will now stand adjourned subject to call of the chairman.

Thereupon, at 12.15 o'clock p. m., the committee adjourned subject to call of the chairman.

The remainder of the statement of transmittal by Mr. MacRae, referred to above by the chairman, is in the words and figures following, to wit:

NEW YORK, *February 12, 1912.*

Hon. AUGUSTUS O. STANLEY,

Chairman Special Committee on Investigation of United States Steel Corporation, Washington, D. C.

SIR: I have the honor to transmit herewith the results of my investigation to this date of accounts, documents, and papers submitted to me by the United States Steel Corporation, in accordance with the authority vested in me under the resolution adopted by the committee.

This report is in three sections:

Section 1. The acounts dealing with the earnings of the corporation since its formation.

Section 2. Exhibits submitted by the United States Steel Corporation in response to requests made by me; extracts from the minutes of the United States Steel Corporation and subsidiary companies; extracts from previous reports made by me to the committee; and

Section 3. A summary of all the evidence extracted from the minute books and exhibits, etc., and from the testimony taken by the committee, up to the completion of the said summary, with which is combined an index in three parts showing (1) the subjects included in the inquiry; (2) the companies and firms; and (3) the individuals investigated and referred to in the testimony, etc., together with a brief of such evidence.

SECTION 1.—ACCOUNTS.

On or about September 1, 1911, the United States Steel Corporation submitted to me printed copies of the published reports of the corporation for the years 1902 to 1910, inclusive; also the preliminary report to the stockholders for the period from April 1, 1901, to December 31, 1901 (nine months), and the profit and loss statements of the subsidiary companies of the United States Steel Corporation, together with a general profit and loss statement of the United States Steel Corporation and the Federal Steel Co., as holding companies, for nine years, 1902 to 1910, inclusive. These statements were accepted by me and I am satisfied correctly show in a summary form the transactions of the several companies up to the point of net earnings.

It would naturally be assumed that the summary income accounts for each year, 1902 to 1910, inclusive, compiled from the several subsidiary companies' profit and loss statements, would result in a general profit and loss or income account of the United States Steel Corporation and its subsidiary companies for the period under examination.

This was the task undertaken from the data furnished me, and resulted in the compilation of summary yearly profit and loss accounts, which statements, however, did not agree with the annual published reports of the United States Steel Corporation except as to total net earnings, all other items, to wit, Total Gross Sales and Earnings, Administrative and General Expenses, Other Income, Interest Charges, Gains and Losses, having been adjusted internally by the United States Steel Corporation before arriving at the figures shown in the published reports.

On or about December 1, 1911, I took up with the officials of the United States Steel Corporation the question of these apparent large discrepancies between the figures compiled by me and those submitted by the corporation in their annual reports; and, on December 12, 1911, I received from the corporation the summaries of general profit and loss accounts of all the companies for the period from January 1, 1902, to December 31, 1910 (nine years), showing the intercompany adjustments, which summaries, condensed and rearranged, are submitted herewith. (Exhibits Nos. 1 to 9, inclusive.) With these summaries was handed to me the following explanatory memorandum, which I quote in full:

These summaries cover a cumulation, according to the respective groups, of the profit and loss figures shown by the various subsidiary companies' statements of general profit and loss. They also take up the eliminations and adjustments made for the purpose of reducing the final aggregate results on the basis of a consolidated unit proposition so far as the same is possible and prac-

ticable. It is on this last-named basis that the figures shown in the annual report in the table of general profit and loss are stated. It will be noticed that the final aggregates, so far as gross figures are concerned, as shown in the attached summaries differ in some particulars from similar aggregates printed in the annual reports for the respective years, although in every case the final net earnings as shown by these statements conform to those printed in the annual report, * * *.

The differences in the aggregate of gross figures, as above referred to, result from a different grouping or classifying of items of receipts and expenditures as worked into these final summaries in comparison with the manner originally taken up in the preparation of the summaries which were printed in the annual reports. The greater portion of the differences is attributable to the fact that in reabstracting the statistics in the compilation of these summaries (all of which work was taken up and done at some considerable time after the annual report statement was gotten out), there was adhered to certain well-defined regulations and principles of classification which seemed to best illustrate the operations. As before stated, the net earnings agree with the final net as reported in the annual reports, and this is the essential feature. These summaries represent our best and most careful efforts to classify all items uniformly in the several companies, in the different years and in accordance with the facts. The result as to net earnings agrees, and that is the test to be applied.

In order to explain the sources of the data presented in the summaries above referred to the following explanation should be made: The subsidiary companies keep their own sets of books just as if they were not controlled by the Steel Corporation as a holding company. Each subsidiary company's books show its sales, or turnover, and its profits. The books of the steel corporation, as a holding company, do not show this data contained in the books of the subsidiary companies, but merely show its own operations, to wit, its income in the shape of dividends upon the stocks of the subsidiary companies and interest upon the bonds of the Carnegie Co., together with certain other miscellaneous income, and its outgo for interest on its bonds, dividends on its stock, administration, and other charges. These summaries are prepared upon separate sheets from the figures compiled from the books of the various subsidiary companies and the steel corporation, or, as it is explained above, "cover a cumulation according to the respective groups of the profit and loss figures shown by the various subsidiary companies' statements of general profit and loss, etc." These summary sheets of the operations of the subsidiary companies are combined with the results shown on the books of the holding company in the form shown in the annual reports, substituting the capital stock and bonded indebtedness of the United States Steel Corporation for the capital stock and bonded indebtedness of the various subsidiary companies and property account to balance.

As a result of my examination of the books, papers, and documents of the United States Steel Corporation, submitted to me, I have pre-

pared the following statements of account or exhibits numbered 1 to 27, to wit:

Exhibit 1. Summary of general profit and loss account of all companies for the year 1902.

Exhibit 2. Summary of general profit and loss account of all companies for the year 1903.

Exhibit 3. Summary of general profit and loss account of all companies for the year 1904.

Exhibit 4. Summary of general profit and loss account of all companies for the year 1905.

Exhibit 5. Summary of general profit and loss account of all companies for the year 1906.

Exhibit 6. Summary of general profit and loss account of all companies for the year 1907.

Exhibit 7. Summary of general profit and loss account of all companies for the year 1908.

Exhibit 8. Summary of general profit and loss account of all companies for the year 1909.

Exhibit 9. Summary of general profit and loss account of all companies for the year 1910.

Exhibit 10. Summary of general profit and loss account for the nine years ended December 31, 1910, manufacturing companies.

Exhibit 11. Summary of general profit and loss account for the nine years ended December 31, 1910, coal and coke companies.

Exhibit 12. Summary of general profit and loss account for the nine years ended December 31, 1910, iron mining companies.

Exhibit 13. Summary of general profit and loss account for the nine years ended December 31, 1910, transportation.

Exhibit 14. Summary of general profit and loss account for the nine years ended December 31, 1910, miscellaneous.

Exhibit 15. Summary of general profit and loss account for the nine years ended December 31, 1910, United States Steel Corporation and Federal Steel Co.

Exhibit 16. Summary of general profit and loss account for the nine years ended December 31, 1910, all companies combined.

Exhibit 17. Detailed summary of depreciation, extinguishment, and replacement funds, etc., for the nine years ended December 31, 1910.

Exhibit 18. United States Steel Corporation and Federal Steel Co., general profit and loss account from April 1, 1901, to December 31, 1910.

Exhibit 19. Summary surplus account of the United States Steel Corporation and its subsidiary companies from April 1, 1901, to December 31, 1910, reconciliation account.

Exhibit 20. Consolidated general balance sheet, December 31, 1910.

Exhibit 21. Surplus account of United States Steel Corporation and its subsidiary companies, April 1, 1901, to December 31, 1910.

Exhibit 22. Surplus account of the United States Steel Corporation and its subsidiary companies, April 1, 1901, to December 31, 1910; summary.

Exhibit 23. Property account from April 1, 1901, to December 31, 1910.

Exhibit 24. Ordinary expenditures for maintenance and repairs for nine years ended December 31, 1910.

Exhibit 25. Adjusted net earnings from April 1, 1901, to December 31, 1910.

Exhibit 26. Statement showing disposition of adjusted net earnings, April 1, 1901, to December 31, 1910.

Exhibit 27. Comparison of securities issued by United States Steel Corporation in 1901 with amounts of securities of constituent concerns and cash acquired therefor.

FORM OF ACCOUNTS.

The summary general profit and loss accounts of all companies for the several years—1902 to 1910, inclusive (Exhibits 1 to 9)—is constant, showing the total transactions of all companies for each year, respectively, grouped as to the transactions of—

(*a*) Manufacturing companies, including the American Bridge Co., of New Jersey.

(*b*) Coal and coke companies.

(*c*) Iron mining companies.

(*d*) Transportation companies.

(*e*) Miscellaneous companies.

(*f*) United States Steel Corporation and Federal Steel Co. (as holding companies).

The figures contained in these groups are recapitulated under each head for the nine years (1902 to 1910) in Exhibits 10 to 15, inclusive, which figures are again summarized in one grand total of all companies combined for the nine years in Exhibit 16.

Column 1 of Exhibit 16 shows the grand net total of the aggregate transactions of all the companies for the nine years ended December 31, 1910, after giving effect to deductions for the "elimination of intercompany interests and adjustments of other accounts" in column 2.

Columns 3, 4, 5, 6, 7, and 8 show the grand gross totals of the aggregate transactions of all companies for the nine years ended December 31, 1910, for the groups named before taking into account intercompany adjustments.

It is impossible for me to allocate the intercompany adjustments between the groups named for all the nine years, and it is stated that the corporation can not supply the information prior to the year 1905.

The total gross sales and earnings of all companies combined for the nine years ended December 31, 1910, amounted to $5,424,631,046.14, of which the sales to outside customers amounted to $3,569,629,995.97, and the sales to subsidiary companies amounted to $1,418,988,132.78 (the balance being earnings of transportation and miscellaneous companies, etc.), and the net earnings for the same period, as shown by the corporation, amounted to $905,039,607.77 (Exhibit 16).

The net operating charges for this period, or, in other words, the manufacturing and producing cost of products sold, exclusive of extinguishment funds and depreciations and replacement funds charged through operating costs, amounted for the nine years to $4,087,667,271.90, in which amount the corporation has included charges for ordinary maintenance and repairs amounting to $252,178,582.34, which amount is shown in detail in Exhibit 24, submitted herewith.

Other charges against net earnings, as shown in column 1 of Exhibit 16, are self-explanatory under the headings shown, to wit: Administrative, selling, and general expenses; taxes; sundry manufacturing and operating gains and losses; interest charges, etc.

It must be noted that the corporation, in addition to the item $252,178,582.34, charged for ordinary maintenance and repairs, has set aside during the nine years for depreciation, replacement funds, etc., the sum of $211,613,963.17, a detailed summary of which is shown in Exhibit 17.

The United States Steel Corporation is a holding company receiving its revenues from dividends on the capital stock of its subsidiary companies owned by it, and, in the case of the Carnegie Co., interest received on the collateral trust bonds owned by it, together with certain other miscellaneous income. The details of this income are shown in the general profit and loss account of the United States Steel Corporation, including the Federal Steel Co., on the credit side of Exhibit 18. The charges against this revenue are also detailed in Exhibit 18. This general profit and loss account from April 1, 1901, to December 31, 1910—nine years and nine months—has been prepared directly from the books of the corporation, and not from the summaries referred to above. It will be seen from this account that out of the total dividends received by the United States Steel Corporation from its subsidiary companies plus the interest on the Carnegie bonds, making a total of $753,124,386.53 for the period of nine years and nine months, the income from the Carnegie Co. in dividends and bond interest amounted to $305,239,537.49, or about 40 per cent of the total. The American Bridge Co. paid the holding company dividends on its preferred stock during this period to the amount of $19,715,577.50, or $2\frac{6}{10}$ per cent of the total.

A condensed statement of the dividends paid by the subsidiary companies to the United States Steel Corporation and the interest paid by the Carnegie Co. on its collateral trust bonds from April 1, 1901 to April 1, 1910, is as follows:

The Carnegie Co	$227,280,000.00
Federal Steel Co., common	114,816,182.00
Federal Steel Co., preferred	31,157,128.50
National Tube Co., common	29,783,905.50
National Tube Co., preferred	27,299,737.50
American Steel & Wire Co. of New Jersey, common	51,110,460.25
American Steel & Wire Co. of New Jersey, preferred	27,299,158.25
National Steel Co., common	6,400,000.00
National Steel Co., preferred	3,779,153.00
American Tin Plate Co., common	7,419,690.00
American Tin Plate Co., preferred	3,634,372.00
American Sheet Steel Co., common	3,184,948.00
American Sheet Steel Co., preferred	5,573,568.00
American Sheet & Tin Plate Co., common	25,540,833.00

American Sheet and Tin Plate Co., preferred	$12,004,804.00
American Steel Hoop Co., common	1,330,000.00
American Steel Hoop Co., preferred	2,041,497.51
American Bridge Co., preferred	19,715,577.50
Oliver Iron Mining Co	2,400,000.00
Lake Superior Consolidated Iron Mining Co	66,689,969.03
Shelby Steel Tube Co., preferred	2,224,995.00
Pittsburg Steamship Co	243,870.00
Clairton Steel Co	4,235,000.00
	675,164,849.04
Interest on the Carnegie Co., collateral trust bonds	77,959,537.49
	753,124,386.53

April 1 to December 31, 1901.—The account submitted herewith, so far as Exhibits 1 to 16 are concerned, do not include any detailed statement of the operations of the corporation for the period nine months from April 1 to December 31, 1901. It is stated that detailed information of the operations for this period before arriving at net earnings can not be produced owing to the fact that actual figures are not available. I have therefore included figures from 1901 (nine months) beginning with net earnings amounting to $74,960,704.21. These net earnings, for the purpose of preparing reconciliation of the accounts, appear for the first time in the "Surplus account of the United States Steel Corporation and its subsidiary companies, Exhibit 21," whereas Exhibit 16 shows net earnings from January 1, 1902, to December 31, 1910, of $905,039,607.77. The net earnings for the nine months ending December 31, 1901, added thereto, make the total net earnings for the period of nine years and nine months $980,000,311.98, and summary surplus account. Exhibit 20 shows the undivided balance to the credit of surplus at December 31, 1910, of $164,143,157.99, which amount I have verified and found to be correct.

The total net earnings for the entire period from April 1, 1901, to December 31, 1910 (nine years and nine months), as shown by the United States Steel Corporation amount to $980,000,311.98. Included in the operating charges before arriving at net earnings, the corporation has figured consistently each year certain amounts, which, in my opinion, should not have been charged against net earnings and which items I have restored to net earnings for the purpose of these accounts. In other words, I have adjusted the net earnings, as shown by the corporation, from $980,000,311.98 to $1,109,146,093.49. The amounts restored to net earnings are shown in detail for each year in Exhibit 25. These include interest on bonds of subsidiary companies, the locked-up intercompany profits in inventories, special depreciation, admittedly charged to construction; employees bonus funds and special compensations, account preferred stock subscriptions, which have been treated as dividends from earnings and not in the nature of additional wages to employees; and, lastly, interest on bonds, mortgages, and purchase money obligations of subsidiary companies.

Exhibit "26" has been prepared for the purpose of showing the disposition made by the United States Steel Corporation of these adjusted net earnings covering the period nine years and nine months ended December 31, 1910.

During the nine years from January 1, 1902, to December 31, 1910, the production of the subsidiary companies of the corporation in rolled and other finished steel amounted to 79,267,363 tons and the adjusted net earnings for the same period—nine years—amounted to $1,029,685,389.28, or an equivalent of approximately $13 per ton. In order that an idea may be had of the net earnings in dollars per ton of the several operating groups of the corporation, I have calculated these figures, and I find the approximate net earnings of $13 per ton of finished product to have been earned as follows:

	Per cent.	Per ton.
Amount earned per ton by manufacturing companies, approximately	61.63	$8.01
Amount earned per ton by coal and coke companies, approximately	5.42	.70
Amount earned per ton by iron mining companies, approximately	16.29	2.12
Amount earned per ton by transportation companies, approximately	13.92	1.81
Amount earned per ton by miscellaneous companies, approximately	2.74	.36
	100.00	13.00

Taking the adjusted net earnings for the nine years ended December 31, 1910, at $1,029,685,389.28 it will be found that the percentage of the net earnings to sales to outside customers for this period amounts approximately to 29 per cent. Twenty-nine per cent on selling price is equivalent to 40 per cent on cost.

During the period from April 1, 1901, to December 31, 1910, nine years and nine months, the United States Steel Corporation showed an earned surplus of	$139,143,157.99
To this amount should be added expenditures for construction accounts, etc., which have been capitalized, amounting for the same period to	210,494,423.55
	349,637,581.54
Interest on United States Steel Corporation bonds and sinking funds	253,066,247.45
Sinking funds on bonds of subsidiary companies	15,401,517.45
Interest on bonds, mortgages, and purchase-money obligations of subsidiary companies	65,443,782.06
	333,911,546.96
Reserve for advance mining royalties	7,000,000.00
Employees' bonus funds	24,670,078.83
Dividends on United States Steel Corporation:	
Preferred stock	269,414,628.66
Common stock	124,512,257.50
	393,926,886.16
Making total adjusted net earnings, as per Exhibit 25	1,109,146,093.49

This agrees with Judge Gary's method of determining profits, as set forth in the tariff hearings (1908, vol. 2, p. 1745) as follows:

> In determining the profits since the company was organized, I take the amount paid as interest on bonds, the amount paid as dividends on stock, and the amount expended for new property, and the amount carried forward to surplus.

Except that I have also added profit-sharing bonus funds to earnings.

In addition to the amount spent for new construction, etc., which has been capitalized, the corporation has also charged in its accounts against the net earnings for the period, nine years and nine months, ended December 31, 1910, the following items:

For ordinary maintenance and repairs from Jan. 1, 1902, to Dec. 31, 1910, nine years per Exhibit 24, actual	$252,178,582.34
For nine months, Jan. 1, 1901, to Dec. 31, 1901, 9 months, estimated	14,000,000.00
Total	266,178,582.34

The corporation has also expended under the heading of depreciation, extinguishment, replacement fund, and bond sinking funds on its subsidiary companies for the nine years and nine months ended December 31, 1910, an aggregate amount of $213,192,140.78.

(NOTE.—I have not tried to determine or to express an opinion as to whether the amount thus set aside for depreciation ($213,192,-140.78) is excessive or inadequate.)

If it should be determined by competent authorities that either a part or the whole of this amount is not a proper charge against earnings, then it should be added to the adjusted earnings ($1,109,146,-593.49), increasing the latter amount by either the whole or any part thereof which is thought proper.

This statement is called forth by the testimony of Mr. Andrew Carnegie before the Ways and Means Committee in the tariff hearings (1908, vol. 2, p. 1871), in which he stated:

> Steel mills and furnaces do not depreciate; they can not be allowed to do so; they must be kept up to the highest standard, and improvements introduced when repairs are needed. The statement above (referring to the annual report for 1907 of the United States Steel Corporation) shows that ordinary repairs and maintenance were deducted before profits of $160,000,000 were declared. The mills in the future, properly maintained, as they must be, in order to run safely and well, will be more valuable than they are to-day.

If, therefore, the amount allowed for ordinary maintenance and repairs as above stated of $252,178,582.34, in accordance with Mr. Carnegie's testimony, is sufficient to keep the plants whole, then the amount of $213,192,140.78 would increase the adjusted earnings of $1,109,146,593.49 to that extent.

The amount of $213,192,140.78 includes $15,401,517.45 sinking funds on bonds of subsidiary companies which I have included in

my statement of adjusted earnings, and therefore the amount subject to the above statement would be $197,790,623.33.

If it should be determined that the above amount of $197,790,623.33 is not a proper charge against earnings (or if a proper amount for depreciation has already been charged to and included in the heading of ordinary maintenance and repairs, which amounts to $266,178,582.34), then the adjusted earnings would amount to $1,306,937,716.82, which would be equivalent to 36.6 per cent on the sales to outsiders of $3,569,629,995.97, which is equal to 57.7 per cent on cost.

SECTION TWO.—EXHIBITS; EXTRACTS FROM MINUTE BOOKS; EXTRACTS FROM PREVIOUS REPORTS. (See Appendix.)

Since my report of December 4, 1911, I have received from the United States Steel Corporation and submit herewith:

(1) Statements showing average production cost of Bessemer and basic pig iron, all northern furnaces; Bessemer steel ingots and open-hearth steel ingots, all northern furnaces; standard Bessemer rails and standard open-hearth rails, all northern furnaces; Bessemer and open-hearth steel blooms and large billets, all northern mills; sheet and tin-plate bars, all northern mills; heavy structural shapes, all northern mills; universal plates, all northern mills; sheared plates, all northern mills; wire rods, all northern mills, for the years 1909 and 1910; and

(2) Statements showing highest and lowest cost of Bessemer pig iron for 1909, basic pig iron for 1909 and 1910, Bessemer steel ingots for 1909, and basic steel ingots for 1909 and 1911.

(3) Since my report of December 4, 1911, I have extracted from the minutes of the executive committee of the United States Steel Corporation all matter in relation to labor and kindred subjects, which I submit herewith.

(4) In an appendix at the foot of this report I submit Exhibit 28, being the extracts from the minute books of the United States Steel Corporation and its subsidiary companies, as far as submitted to me and examined by me, as enumerated in my report to the committee of December 4, 1911.

(5) Also, in order to complete the printed record of my proceedings, I submit such portions of my reports of July 18, August 2, and December 4, 1911, as are material for supplying a complete record.

SECTION THREE OF MY REPORT INCLUDES THE FOLLOWING:

Exhibit 29, being a summary of all the evidence taken or collected by the committee up to the completion of the said summary (to which all later and additional testimony or evidence can be added in the loose-leaf binders which are submitted herewith), with which

is combined an index in three parts, showing (1) the subjects included in the inquiry, (2) the companies and firms, and (3) the individuals investigated and referred to in the testimony, etc., and below a brief of such evidence.

Hereunder I submit a brief of the evidence as far as the same has been summarized in the summary and index submitted herewith, which summary and index and brief were prepared by Mr. Anthony J. Ernest, of the New York bar, in collaboration with me.

I had Mr. Ernest prepare the matter relating to these subjects, inasmuch as my authorization and instructions from the committee embraced a wider inquiry than merely examining the accounts, and included an examination of the Sherman law, the resolution appointing the committee, the testimony, and other data.

The sources of the data are: (1) The minute books of the United States Steel Corporation and its subsidiary companies as far as furnished to me and examined, which are enumerated in my letter to the committee of December 4, 1911 (vol. 36, p. 2548); (2) the testimony taken before the committee; (3) the exhibits; (4) report of the Senate investigation of the acquisition of the Tennessee Coal, Iron & Railroad Co.; (5) the testimony before the Ways and Means Committee of the House of Representatives in the tariff hearings (1908); (6) the report of the Commissioner of Corporations upon the steel industry; (7) the Government's bill of complaint against the United States Steel Corporation, and the answer of the Steel Corporation and others; (8) the records in suits against the Steel Corporation; (9) Bridge's "Inside History of the Carnegie Steel Co.;" (10) the books published by the Russell Sage Foundation in the Pittsburgh Survey, entitled "The Steel Workers" and "Homestead," by Fitch and Byington, respectively; (11) other books and publications dealing with the steel industry, such as "The Iron Age," "Swank's Reports," etc.

(Later and additional data can be added to the summary of the evidence under proper headings in the loose-leaf binder submitted herewith.)

A large amount of data has been collected upon various subjects, but only such matters as are relevant and important to the inquiry of the committee are presented in the brief of the evidence. Following the lines of the inquiry of the committee, under the resolution creating it, and the evidence developed at the hearings, certain conclusions may be drawn from the evidence, which may be briefly stated, as follows:

1. Competition between previously competing concerns was terminated by the concentration of the control of upward of 180 corporations into one security-holding company known as the United States Steel Corporation.

2. The United States Steel Corporation is merely a security-holding corporation, engaging in no business except the control through stock ownership of the subsidiary companies.

3. There were acquired and brought under a single control upward of 180 concerns in lines of business allied with the steel-making business, which, as Mr. Gary testified, no longer compete with each other (2 ——; 3 ——), to wit:

(*a*) Ore owning and mining companies, which are not now competing in the sale of ore.

(*b*) Transportation companies. Amongst others are the Duluth & Iron Range Railroad, formerly controlled by the Minnesota Iron Co., and the Duluth, Missabe & Northern Railroad Co., formerly controlled by the Lake Superior Consolidated Iron Mines, these two railroads being substantially parallel and about 25 miles apart and inclosing a large area within a short distance of both roads—the Duluth & Iron Range Railroad Co. on the north and the Duluth, Missabe & Northern Railroad Co. upon the south.

(*c*) *Pig-iron plants.*—The Steel Corporation has combined a number of concerns that manufacture pig iron. Before the consolidation some or all of these concerns had been purchasers of pig iron in the market in competition with each other. In 1899 the American Steel & Wire Co. bought pig iron from the Federal Steel Co., and in 1900 it bought pig iron from the Chenango Furnace Co., the Brier Hill Iron & Coal Co., and in 1900 it sold pig iron to the Carnegie Steel Co. (See 6–317.) (See Summary of Evidence for other transactions.)

First. The executive committee of the Steel Corporation early announced the policy:

Subsidiary companies will not compete against each other if they are buying pig iron at the same time.

(Executive committee minutes, Apr. 20, 1901), and it was recognized that purchases of pig iron would raise prices $1 or $2. In the minutes of the directors of the Carnegie Steel Co., April 1, 1901, it was stated:

If we were to buy to-day the iron submitted, it will put the price up $1 or $2 per ton.

Second. This power to raise the price of pig iron by purchases was exercised and advocated because of the gain to be made upon sliding-scale contracts and upon the price of finished products. For example, in the minutes of the directors of the Carnegie Steel Co., May 11, 1903, it was stated:

Mr. COREY. I should like to have the views of the board as to the advisability of buying iron for the third quarter. There is only about 65,000 tons in the market for the third quarter's delivery, and if we buy at this time it will be largely for the purpose of preventing the furnace people from offering it around,

and thus demoralizing the market. If we could buy up to this quantity, it would undoubtedly do a great deal to strengthen the situation. The price would be around $18, Valley. After discussion it was agreed that the iron for the third quarter should be purchased, with assurances from the furnace people that 65,000 tons was all the available iron for that quarter and that no more would be put in the market.

On May 5, 1903, in the minutes of the executive committee of the Steel Corporation, it is said that the president stated:

That he believes we ought to always be buyers of some pig iron; that it would be better to even shut down some of our high-priced furnaces and be purchasers; that the price of our finished steel products being regulated by the price of pig iron, we ought not to be endeavoring to get the cheapest iron; that we ought to maintain prices by little purchases; that $1 a ton is such a little thing compared with the advantages we receive in the finished products; that if we did purchase pig iron, there would not have been the present downward tendency in the market.

The chairman stated that he would be in favor of making the purchases.

* * * I do not think we ought to buy pig iron at prices considerably higher than the prices will be when we want the iron. Business conditions are such that next July and August we ought to buy pig iron at $18.50 or $19 a ton, but I do not think it is necessary to buy it now.

The price advanced from $16 to $21 because of this scarcity, but the price of unfinished steel did not advance. I would like to see pig iron sent down to about $16.50 a ton and stay there.

Mr. GAYLEY. * * * I think we ought to hold the price of pig iron at $18.50, and that it is important for us to stay in the market and buy at $18.50 rather than miss the deal. * * *

Upon motion, duly seconded, it was voted that the matter be placed in the hands of the president to act. (Cf. Carnegie Steel Co. directors' minutes, Dec. 3, 1906.)

It is noted in the minutes of the Carnegie Steel Co. directors, November 24, 1903, that:

The makers met last week and agreed to run only four days a week. They are tired of low prices.

References to purchases of all the iron upon the market are also made in the minutes of the Carnegie Steel Co. directors, May 18, 1903, and April 3, 1905.

As late as February, 1910, the purchase of 2,550,000 tons of pig iron by the sudsidiary companies was referred to the chairman and president of the United States Steel Corporation (minutes finance committee, Feb. 24, 1910).

This amount represents, as we shall see below, 322,000 tons more than the combined blast-furnace capacity added to the Steel Corporation by the purchase of the Tennessee, Union, Clairton, Shelby, Troy, and Trenton companies added together.

While forbidding these subsidiary companies to compete in buying from independent makers of pig iron, the United States Steel Corporation at the same time restrains its subsidiary concerns from producing and selling pig iron and causes an increase in price and prevents an increase in output, as will be further substantiated below. For example, it appears that before the control of the Tennessee Coal, Iron & Railroad Co. was acquired by the United States Steel Corporation, the Tennessee company sold pig iron in 1904 for $9 a ton, but after the purchase by the United States Steel Corporation the price was raised to $12.50 a ton; and the Iron Age said, in 1908 (July 23):

> One of the largest interests is practically out of the market, refusing to depart from the schedule of $12.50. The announcement that the output is not to be increased to the extent recently arranged for is significant.

(Tariff Hearings, vol. 2, 1908, p. 1382.)

Judge Gary testified that the Tennessee company produced 602,000 tons of pig iron in 1907. This was a little over half of its capacity. (See Report of Commissioner of Corporations, p. 269.) It has also been testified that pig iron could be made cheaper at Birmingham, Ala., than anywhere else in the United States (15–1011, 983), the Birmingham cost being $4 under the Pittsburgh cost, as estimated by one witness (15–983), and only 40 to 43 per cent of the Tennessee company's products are sold in the South, the balance being sold in the North (17–1257). The Union-Sharon plants had a pig-iron capacity alleged to be 750,000 tons a year in the Government complaint (p. 28), or 180,000 tons a year, as stated in the answer of the Steel Corporation (p. 24). The Clairton plant had a capacity of 475,000 tons a year, as alleged in the Government complaint (p. 29), or 420,000 tons as alleged in the answer of the Steel Corporation (p. 26).

With the light afforded by the information from the minutes set forth above, there may be some modification of the inference drawn by the commissioner of corporations (p. 367 of his report):

> When it is recalled that during this period the large pig-iron capacity of the Union-Sharon and Clairton Steel Companies and of the Tennessee Coal & Iron Co. was acquired, not to mention still larger additions by new furnaces built (see table 29, p. 269), the failure of the corporation to substantially increase its percentage is a striking illustration of the growth of independent production.

Now, the table referred to in the quotation (table 29, p. 269) shows additions to blast-furnace capacity by the purchase of the Tennessee, Union, Clairton, and Shelby, as well as Troy and Trenton companies, along with the new construction of the Steel Corporation (from April 1, 1901, to Jan. 1, 1911), of 8,800,468 tons, which resulted in a total capacity of 16,240,700 tons on January 1, 1911.

But upon page 370 of the report there is a table showing the production of pig iron, spiegel, etc., yearly, closing in 1910 with a pro-

duction of 11,831,398 tons, and also showing that the corporation's production of steel ingots and castings exceeded its pig-iron production by an average of over 1,750,000 tons a year.

NOTE.—It takes about 1⅛ tons of iron to make a ton of steel. (Tariff Hearings, 1908, vol. 2, p. 1635.)

In other words, the Steel Corporation produces 5,000,000 tons less than its total capacity for blast-furnace production, and at the same time produces an average of 1,750,000 tons a year of steel ingots and castings (from 1901 to 1911) more than its production of pig iron, spiegel, etc. The commissioner of corporations says (p. 371) this excess of steel production over blast-furnace production does not mean that the Steel Corporation has relied, "to an increasing extent," upon outside furnaces for its supply of pig iron, but that it is largely due to the use of scrap and steel in open-hearth steel manufacture. But, of course, the commissioner is not referring here to the diminution of blast-furnace production of 5,000,000 tons below the blast-furnace capacity. It is in connection with this underproduction that the acquisition of the Tennessee, Clairton, Union, Shelby, Troy, and Trenton companies should be considered, because, notwithstanding that the capacity of the plants acquired only represented 2,228,000 tons, or 29⅝ per cent of the original capacity of the Steel Corporation in 1901 (whereas the new construction added 6,572,468 tons, or 88 per cent, to the original capacity (id., p. 269)), nevertheless these acquired concerns were removed from the independent field as makers of pig iron.

The total capacity added to the Steel Corporation of 2,228,000 is less than half of the amount (5,000,000) by which the corporation's production remains below its capacity, and it is not one-third of the amount of capacity added by the new construction of the Steel Corporation.

It would seem to be clear therefore that the acquisition of these concerns was of no consequence whatever in increasing the blast-furnace capacity of the Steel Corporation compared to its shown underproduction and new construction; but the only consequence of the acquisition which can be seen is the removal of these concerns from the competitive field.

The removal of this independent production from the market, along with the large production already controlled by the Steel Corporation, in view of the conduct of the corporation as to maintaining the price of pig iron, as indicated above, for the benefit derived from their finished product, necessarily tended to forestall competition in pig iron.

If it be claimed that the pig-iron production or capacity of the plants controlled by the Steel Corporation has been decreased since their acquirement of control, such action on the part of the Steel Cor-

poration is entirely consistent with the purpose to maintain a high price on a limited production.

(D) *Coal and coke companies.*—Before the organization of the Steel Corporation coke was sold by the Frick Co. and other companies to various companies now combined in the Steel Corporation, as well as to Jones & Laughlin, Cambria, and other independent concerns.

Coke was sold by the Pocahontas Co. to the Illinois Steel Co. before the formation of the Steel Corporation, and was sold to the Federal Steel Co. by the Frick Co.; coke was sold to the National Steel Co. before the formation of the Steel Corporation; and the National Co. had other sources of supply. But after the formation of the Steel Corporation, and as early as October, 1902, Mr. Gayley said that the surplus coke not used by the Steel Corporation amounted to 2,400 tons, and in this connection:

> We sell this coke at a profit of 5 cents or 10 cents per ton, and have done this merely to regulate the price. (U. S. S. C. Ex. Com., Oct. 14, 1902.)

It appears by an affidavit of Mr. Lynch, quoted in the Report of the Commissioner of Corporations, that there were less than 15,000 acres of unmined coal in the entire Connellsville Basin which did not belong to the Steel Corporation. In December, 1901, the Steel Corporation secured a lease of 50,000 acres of Pocahontas coal. Later it acquired competing coke-making plants of the Union Steel Co., Clairton Steel Co., Hecla Coke Co., Tennessee Coal, Iron & Railroad Co., Hostetter-Connellsville Coke Co. (additional 36.4 per cent interest), and coal lands in Illinois and Indiana, and also 7,000 acres of Colonial Coke Co. tract, and 9,000 acres of the Monongahela River Consolidated Coal & Coke Co., and later and other large acquisitions. (See summary of evidence.)

The concentration of control of these properties has increased their value, it is said by the Commissioner of Corporations. (Report, pp. 311, 315.)

After the organization of the Steel Corporation, as stated above, the surplus coke for sale by the corporation was only 2,400 tons, and this was sold "merely to regulate the price." Before the organization, Jones & Laughlin, Cambria, Lackawanna Co., Republic Co. were sold in some cases all requirements by the Frick Coke Co. The acquisition of the Frick Co. and the consolidation with it of a large number of coking companies prevented this free competition with outside companies in sales to the independent steel concerns above named.

Before the organization of the Steel Corporation the Carnegie Steel Co., by stock control of the H. C. Frick Coke Co., compelled that company to supply coke to the Carnegie Steel Co. below the

market price (at $1.65 a ton), which caused the Frick Co. to sustain a loss which has been estimated at $4,000,000 a year (the market price being $3.50 a ton), and to refund $596,000 to the Carnegie Steel Co. for coke sold the year before this arrangement. This arrangement undoubtedly prevented the selling of coke to the Carnegie Steel Co. by independent coke concerns, as well as enriching the steel company at the expense of the coke company, by means of manipulation by directors interested in another company.

The form of control exercised over the coke company was changed by the consolidation of the coke company with the Carnegie Co. and the subsequent consolidation with the United States Steel Corporation and thereafter with the other coke companies, but the control was perpetuated and extended by these later consolidations, which also, as we have pointed out, prevented trade with independent steel concerns and prevented competition with independent coke companies, except by the sale of the surplus coke which is merely sold to regulate the price as above stated.

(E) *Steel making companies.*—Between none of these concerns was there any restraint of competition before the consolidation (except illegal pools), so far as now known, and between many of them there was active competition, as has been partly admitted (see answer of United States Steel Corporation in Government suit) and still further can be proved.

4. A large number of the major concerns were acquired at much inflated valuations, succeeding several increases in the capitalization of preceding incorporations. This was admitted to be due, in some cases, to the greater combination value or merger value of the consolidation.

(See report of Commissioner of Corporations for details of capitalizations and overcapitalization and overvaluation, page 326 and generally.)

In this connection it may be noted that in giving testimony before the Ways and Means Committee in 1908, E. H. Gary, chairman of the Steel Corporation, was questioned with respect to a valuation of $1,782,187,383 for the properties of the Steel Corporation at the close of 1907. An excerpt from his testimony before that committee follows:

Mr. COCKRAN. Of this whole sum of $1,782,000,000, was not $1,000,000,000, at least, capitalized profits as distinguished from original investment?

Mr. GARY. I should have to guess at that; but I should guess yes, including increases in value. (Tariff hearings, vol. 2, 1745.)

From the report of the Commissioner of Corporations on the steel industry the following facts are gleaned:

That at the organization of the United States Steel Corporation in 1901 its capitalization was about $700,000,000 more than the fair

market value of its tangible property, and that in so far as that excess represented value in 1901 it was value due either to increased earning power from elimination of competition, concentrated ownership of the basic natural resources, iron, ore, and coal, or in some degree integration efficiency.

Also that since the formation of the corporation that competition with the so-called independent steel companies, so far as prices are concerned, has been modified by the policy of "cooperation." (Id., p. 373.) That in the formation of the corporation and of the mergers of other companies which preceded it and are now subsidiaries of the United States Steel Corporation, the three most important features to be considered were:

First. The restriction or elimination of competition, the most important and the principal cause of most consolidations in the steel industry.

Second. Integration, namely, the acquisition under one control of raw materials, manufacturing plants, and transportation facilities.

Third. The creation of a great amount of inflated securities which, in many cases, was the controlling inducement for owners to dispose of their businesses. Also the opportunity for the underwriters and promoters to reap a huge profit in the flotation of the said securities. In this connection it may be noted that the profits of the syndicate of the United States Steel Corporation amounted to, roughly, $130,000,000 in par value of preferred and common stock, from which, deducting $28,000,000 in cash contributed by them, will leave a cash profit to the promotors of $62,500,000 in addition to $6,800,000 commission subsequently paid to J. P. Morgan & Co. for the bond-conversion scheme.

5. The process of combination of these concerns may be divided into three parts for convenience in considering their effect upon competition:

(A) The original or early combination of the major concerns and those immediately subsidiary, which necessarily tended to eliminate all possibility of competition between them.

(B) Instances of combinations or consolidations admittedly or inferribly having a direct effect to remove competition, or in the accomplishment of which the removal of competition was the declared object or is the easily inferred object of the consolidation.

(C) Other acquisitions of corporations and concerns in related lines of business, for the acquisition of which no explanation has been offered and none appears except the visible consequence of such acquisition, to wit, the removal of such concerns from the independent field.

These three divisions of the process of consolidation and combination will be referred to below.

It will perhaps be admitted that any single case of combination with intent to remove competition will reflect light upon the other cases where the circumstances are similar and the methods pursued were similar, although the intent to remove competition is not specifically avowed.

(A) The early consolidations brought some very large concerns having numerous subsidiaries under the control of the Steel Corporation. Some of these at that time controlled large percentages of the business in their several lines. The National Tube Co. is admitted in effect to have controlled 72 per cent of the business in tubular products in 1899 (p. 8, answer of Steel Corporation); the American Steel & Wire Co., of New Jersey, controlled 77.6 per cent of the wire-rod production and 65.8 per cent of the wire-nail production of the United States; the American Tin Plate Co. controlled a large percentage of the tinplate production, and in 1908, the production of tinplates and terne plates controlled by the Steel Corporation was estimated at 72 per cent; the Steel Corporation controlled 70 per cent of the Bessemer ingot and casting production and 59 per cent of the open-hearth ingot and casting production; in year prior to 1907, it appears from the reports of the American Iron & Steel Association that the Steel Corporation did not produce any open-hearth rails, but in 1908 it controlled 46.3 per cent of the production, and in 1910, 57.4 per cent of the production of open-hearth rails; the ore holdings of the corporation were greatly in excess of all others combined and were estimated at 76 per cent of the Minnesota ore by the Minnesota tax commission for 1907, and although there is a large amount of ore in other States:

The steel industry is essentially based upon the ores of the Lake Superior district. (Report of Commissioner of Corporations on the Steel Industry, pp. 58 and 380.)

NOTE.—The above percentages were obtained from the tables of the American Iron & Steel Association, except where otherwise stated. (See Report of Commissioner of Corporations.)

(B) After the organization of the Steel Corporation a number of concerns were acquired admittedly or inferentially because they were competing concerns.

As throwing light upon all instances of this class the following extract from the minutes of the meetings of the auditors of the subsidiary companies (Dec. 8–9, 1904), presided over by W. J. Filbert, comptroller of the Steel Corporation, is important:

PLANTS, ABANDONMENT OF.

* * * * * * *

It was stated that often the principal consideration about the purchase and later abandonment of a certain plant was the fact that by getting the plant we were able to eliminate its competition, * * *.

(1) Griswold Wire Co., Braddock, Pa., were said to be "the only ones making ties in opposition to our company" (United States Steel Corporation, executive committee minutes, June 3, 1902), and while the chairman stated that the property had been talked of as worth $50,000, it was upon motion of Mr. Steele recommended that the property be bought at $75,000 or better.

But in the minutes of the directors of the American Steel & Wire Co., of July 15, 1902, it appears that—

> They (the committee) had completed such purchase by the payment of $105,000, on basis of $140 per share (the sellers having guaranteed that the assets exceed the liabilities by about $30,000, making the actual purchase price to this company about $75,000).

Among the assets of this company it appears there was a patent for making dimension or exact-length ties (United States Steel Corporation, executive committee minutes, June 3, 1902), and this may explain the statement that "they are the only ones making ties in opposition to our company," inasmuch as the patent may have enabled the Griswold Co. to make ties "in opposition to" the Steel Corporation, but only 42 days passed after this statement until the purchase of that company's entire capital stock of $75,000 at $140 per share, or $105,000, while its assets exceeded its liabilities by about $30,000. The excess of $75,000 was evidently paid to stop the Griswold Co. from making ties "in opposition to our company," and to have the ties made by the Steel Corporation's subsidiaries.

II. The Union Steel Co. is referred to a number of times as follows:

Mr. Corey (president), in the minutes of the Carnegie Steel Co. board of directors, July 1, 1902, said, in part:

> Mr. COREY. The only item of interest I have to-day is to state that at the last meeting of the presidents it was decided by a majority, and approved by the president of the Steel Corporation, that Carnegie and National Steel Co. are not to sell unfinished material on scale contracts to any companies competing with constituent companies of the corporation; and such scale contracts with such competing parties are to be discontinued at as early a date as possible. * * *
>
> I was much surprised to find we have such a small number of concerns on our books receiving unfinished steel from us, which compete with the constituent companies. The only one in fact that takes any great quantity is the Union Steel Co.

In November of the same year (Nov. 4, 1902) there is another reference to the Union Steel Co.:

> UNION STEEL CO.
>
> Mr. COREY. * * * I am strongly in favor of pushing the Union Steel Co. as hard as we can. There is nothing we can do to smooth matters over with them as they are determined to do all they can against us. For this I think $28 for billets would be high enough.

In the meeting of directors of the Carnegie Steel Co. of July 1, 1902, it was stated that unfinished steel sold to concerns competing with constituent companies will be "at such figure as will be above that at which we sell constituent companies."

In December of the same year (Dec. 9, 1902) it is stated in the minutes of the finance committee of the Steel Corporation that Judge Reed submitted a contract with the Union Sharon people, and the chairman was instructed to execute the same. (Mr. Perkins in the chair.)

In January, 1903 (Jan. 6, 1903), in the minutes of the directors of the Steel Corporation, reference is made to—

contract dated December 15, 1902, with A. W. Mellon, R. E. Mellon, W. R. Donner, William Flinn, George W. Darr, John Stevenson, jr., and J. P. Whitla for the purchase of all the capital stock of the Union Steel Co., in which Henry Frick has an interest, upon terms and conditions set out in a written agreement read before the meeting and adopted by an affirmative vote of all present, Mr. Frick retiring, the capital stock amounting in the aggregate to $20,000,000, including stock of Henry C. Frick.

This contract is submitted with this report as Exhibit K. It was made between the United States Steel Corporation and A. W. Mellon, R. B. Mellon, W. H. Donner, William Flinn, George W. Darr, John Stevenson, jr., and J. P. Whitla on December 15, 1902. The date should be noted. A previous agreement dated November 20, 1902, had been already entered into between the Messrs. Mellon, Donner, Flinn, Darr, Stevenson, and Whitla, providing for the merger of the Union and Sharon concerns, which is also submitted with Exhibit K herein.

The original capitalization of the old Union Steel Co. was $1,000,000 and of the old Sharon Steel Co. $3,000,000.

In this agreement of December 15, 1902, the United States Steel Corporation agrees that the men above named are to go ahead with the merger of the Union and Sharon companies and increase the capital stock to $20,000,000, and issue $45,000,000 of bonds, and the agreement then continues:

Ninth. Upon the organization of Union, as herein provided, the vendors agree to sell and transfer unto the steel company, and the steel company agrees to buy all of said $20,000,000 of the capital stock of Union. In consideration thereof, and contemporaneously with the said transfer, the steel company hereby agrees that it will duly and legally guarantee the payment of the principal and interest of all of said $45,000,000 of bonds of Union as the same shall respectively become or be made due and payable according to the terms of said bonds. * * *

Tenth. The vendors severally agree with the steel company that they respectively will not, within the United States or Dominion of Canada, for a period of 10 years from December 1, 1902, engage directly or indirectly in the manufacture of iron or steel, or articles made therefrom, now manufactured by the steel company, the production of furnace coke, or the mining or produc-

tion of iron ore, except in the Territory of Arizona and State of Florida; excepting, however, from the terms hereof the enterprises, if any, in which such parties may now respectively be engaged.

And in the next paragraph, viz, the eleventh, it is provided that—

the said vendors do further stipulate that they do not have, either individually or together, any ore properties which are not owned by Union or Sharon, or the companies controlled or owned by said companies, respectively.

Sixty-five days after making of this agreement, and in pursuance thereof, at the meeting of the stockholders of the Union Steel Co. held February 18, 1903, the capital stock was increased from $1,000,000 to $20,000,000; and an issue of bonds in the amount of $45,000,000 was authorized.

Although the merger of these properties included some 11 subcompanies holding the ore, coal, and other property at a large capitalization of about $17,000,000, nevertheless the Report of the Commissioner of Corporations (pp. 282–286) points out that there were many overvaluations and very high valuations in calculating the worth of these properties, and finally on page 286 says:

There can be no question that the prices paid by the Steel Corporation for both the coal and the iron-ore properties were considerably in excess of a fair valuation at the time of the transfer. The real significance of the transaction seems to be that the steel corporation desired to eliminate the competition of certain influential interests back of the Union concern, particularly that of Mr. Frick, and that the amount necessary to induce these owners to retire from such competition was, in effect, charged against the ore and coal * * *.

The truth of this is corroborated by the fact that since the United States Steel Corporation has held this property and for a number of years it has not paid the interest on its bonds, the deficit being from $500,000 to $2,000,000 in some years and aggregating over $9,000,000 in nine years (see Exhibit 18*c*), and this failure to pay, it seems, was not upon the whole $45,000,000, but considerably less (see p. 282, Report of Commissioner of Corporations on Steel Industry, pt. i, July 1, 1911), the published reports of the United States Steel Corporation showing that only about $36,000,000 of these bonds were ever outstanding in the hands of the public, although it also appears that in 1905 (Union Steel Co., minutes of board of directors, Sept. 26, 1905) that the Union Steel Co. issued $3,874,000 of bonds in addition to those theretofore issued.

The conclusion of the Commissioner of Corporations that the acquisition of the Union Steel Co. property was really aimed at eliminating competition is strengthened by the evidence stated above, and will be further supported by further evidence. In this connection, it seems clear that the buying of these properties did not add to the efficiency of the organization of the steel company nearly as much as

would have been added by the expenditure of an equal amount of money for new construction.

The answer of the Steel Corporation in the Government suit denies the intention to eliminate competition in acquiring this property, but admits that the production of the Sharon Steel Co. was small, and that the capacity of the Union Steel Co., after the merger of the Sharon Steel Co. in November, 1902, was 180,000 tons of pig iron (as against 7,802,812 tons production of the Steel Corporation, 1902, Report Commissioner of Corporations, p. 360) and 350,000 tons of steel ingots (as against 9,743,918 tons production of the Steel Corporation, 1902, Report Commissioner of Corporations, p. 360). (See above in relation to underproduction of pig iron, par. 3, subd. C.)

Comparing the investment of the Steel Corporation in manufacturing property devoted to the production of 7,802,812 tons of pig iron and of 9,743,918 tons of steel ingots with the cost of the Union-Sharon properties, to wit, $30,860,501 and the guaranty of $45,000,000 of bonds (after deducting a fair valuation for coke, ore leases, and fee holdings and transportation companies), it is believed that the result will justify the conclusion of the Commissioner of Corporations set forth above (report, pp. 282–286).

A comparison of this amount of $75,860,501 paid and guaranteed for the Union-Sharon properties, with the valuation of the property of the seven large so-called independent steel concerns four years later, in 1907, is illuminating. These were as follows:

Bethlehem	$44,450,881
Cambria	45,281,892
Colorado	41,919,448
Jones & Laughlin (capital and bonds)	45,000,000
Lackawanna	65,647,388
Pennsylvania	25,377,147
Republic	53,092,153

The Commissioner of Corporation (report, July 1, 1911) refers to this matter further, as follows (pp. 252–254):

> The acquisition of this company (Union Steel Co.), which, as stated above, had just absorbed the Sharon Steel Co. and the old Union Steel Co., is important not only on account of its large production, but also because both the constituent companies had been organized by individuals who had previously been in the steel business, but who had sold out their properties to one or the other of the various consolidations which later constituted the United States Steel Corporation. This purchase, moreover, was of particular interest because the Union and Sharon Steel companies were exceptionally aggressive competitors, with strong financial backing.

After reviewing the capacity of the Sharon Co., the report continues (p. 253):

> It will be seen, therefore, that the company's operations were of a character to bring it into sharp competition with the United States Steel Corporation. It

should be noted, moreover, that the company had taken important steps toward securing a supply of raw materials. * * *

After reviewing the capacity of the old Union Steel Co., continues (p. 254):

Among other influential interests back of the concern was H. C. Frick. Mr. Frick at this time was also a director in the United States Steel Corporation.

Merger of Union and Sharon concerns.—The strong backing of the Union Steel Co., together with its extensive operations, made it an important competitor of the United States Steel Corporation. Its operations assumed still greater significance when, toward the end of November, 1902, announcement was made of the merger of the company and the Sharon Steel Co., under the name of the Union Steel Co., to be capitalized at about $50,000,000, thus forming the largest consolidation in the steel industry proper which had been effected since the organization of the United States Steel Corporation itself.

Plans for increasing capacity and for building a railroad from Lake Erie to Connellsville district also referred to (p. 254):

These plans for the merger of the Sharon and Union companies had hardly been completed, however, before the further announcement was made (in the latter part of November, 1902) that the United States Steel Corporation had purchased the entire property. * * *

There can be no doubt that the principal motive of the Steel Corporation was to prevent the competition which the rapidly extending operations of the Union concern foreshadowed, and especially to eliminate the rivalry of Mr. Frick.

These interests were disabled from competition by paragraphs 9 and 10 of the agreement set forth above, and by paragraph 11 stipulated that they owned no ore except that held by the Union-Sharon concerns then conveyed to the United States Steel Corporation. In consideration of this agreement and stipulation, inter alia, there was paid and guaranteed by the United States Steel Corporation the huge sum mentioned above.

III. The Shelby Steel Tube Co. is referred to in the minutes of the executive committee of the Steel Corporation (July 30, 1901) as follows:

Mr. Converse stated that it is the only real live competitor the National Tube Co. has, and that between the two companies all the patents for seamless tubing manufactured are owned.

Mr. Converse was and had been a director of the National Tube Co. and was undoubtedly familiar with the conditions in the tube business. In the minutes of the executive committee of the Steel Corporation (Apr. 20, 1901), it appears that the president stated that the Carnegie Steel Co. had a contract with the Shelby Tube Co. to supply it with steel, and that it was very favorable to the Carnegie Co., inasmuch as the latter company could so arrange the price of steel that it would be rather difficult for the Shelby Co. to continue in business; and Mr. Converse stated the National Co. and the Shelby Co. are the only concerns making seamless tubing.

In the minutes of the executive committee of the Steel Corporation (Apr. 24, 1901), it appears that the president reported that he had

had an interview with Mr. Miller, of the Shelby Tube Co., and expects to receive from him a statement covering the last six months, showing shipments of iron and amount of orders on the books. Mr. Miller's statement will be furnished to Mr. Schwab by the National Tube Co. It was suggested that some arrangement could be made with Mr. Miller, with a view to maintaining prices, and that some prices now could be advanced by both companies.

In the testimony (vol. 23, p. 1639), there appears the following extract from the minutes of the executive committee of the Steel Corporation, April 30, 1901:

The president reported in a general way the result of an interview had with Mr. Miller, of the Shelby Tube Co. Mr. Schwab believes it is not at present feasible to make any division of the business of the National and Shelby Tube Cos. Upon the question of the acquisition of the property of that company, the president stated that the stock outstanding amounted to $8,000,000 of common and $5,000,000 preferred stock. He also gave figures showing the business transacted by the Shelby Co. He is impressed with its earning capacity, and believes that under our control it would net about 50 per cent. He rather thinks that the whole property could be purchased for about $3,500,000. Mr. Converse stated that it is the only real live competitor the National Tube Co. has, and that between the two companies all the patents for seamless tubing manufacture are owned. The president suggested that if the purchase is made it might be done by giving stock of the United States Steel Corporation in exchange for stock of the Shelby Co., and he would propose one share of preferred stock for two shares of preferred Shelby stock; one share of common stock for five shares of Shelby common stock. Mr. Converse estimated that the properties of the Shelby Tube Co. had cost about $4,000,000, and thinks very well of such a purchase if it can be made at a price named by the president and effected through exchange of the stock. The chairman suggested that the president of this company take up the matter again with the Shelby people simply on the basis of an intermediary with the intimation that the president does not know what can be done, but will see, etc. Mr. Converse stated that if Mr. Schwab can effect such a deal, it is a very good one, and that this committee should then recommend it to the finance committee. The president stated that he would have another interview with Mr. Miller on the lines of the above and would report later.

In the minutes of the executive committee of the Steel Corporation (May 20, 1902), it was stated that the Shelby Tube Co. should run over 100,000 every month—

besides protecting the National Tube Co. Mr. Hearne and Mr. Schiller report very favorably on that proposition.

In the answer of the Steel Corporation (p. 23), after referring to the indifferent success of the National Tube Co. in the attempt to manufacture under one of its patents and the worthlessness of another patent, it states:

That the only patent which proved to be successful was owned by the Shelby Co. and employed by it in the manufacture of its product of seamless tubes; that it was the desire of the Steel Corporation to manufacture seamless tubes for its customers, and in order to acquire the facilities for so doing, it negotiated with the owners of the Shelby Co. for the purchase of its plant and

patents, which resulted in the acquisition of the stock of this company, as stated in the petition.

In this connection it should be noted that the answer of the Steel Corporation admits in effect (p. 8) that in 1899 the relative production of tubular products controlled by the National Tube Co. was 72 per cent; and the Government's bill of complaint alleges that the Shelby Co. produced about 90 per cent of the products which were produced in its lines in the United States (p. 26).

In the report of the Commissioner of Corporations (p. 167) the value of the tangible assets of the Shelby Tube Co. is given as $2,791,000, and at page 145 it is stated that $2,893,900 "may fairly be said to represent the approximate cost of the Shelby Steel Tube property to the Steel Corporation, reduced to a cash basis."

And it is also stated:

Through the acquisition of this concern, the Steel Corporation established its supremacy in the seamless tubing branch of the steel industry (p. 145).

(C) A number of concerns in the steel business and allied lines were acquired by the Steel Corporation, for the acquisition of which there does not appear to be any persuasive explanation, such as the increase of the efficiency of the Steel Corporation, and, in fact, no reasonable explanation except the visible consequence of the acquisition of such plants, to wit, the removal of such concerns from the independent field.

1. *The Troy Steel Products Co.*—In the minutes of the directors of the United States Steel Corporation of January 6, 1903,

A memorandum agreement was approved dated December 24, 1902, with A. C. Bedford, representing John D. Rockefeller, H. H. Rogers, and others, being the owners of a majority of the securities of the Troy Steel Products Co., which company is the owner of the plant known as the Troy steel plant, not less than a majority interest to be purchased for the sum of $1,100,000, payable either in cash or in the proposed second mortgage 5 per cent bonds.

The finance committee was authorized to determine the final disposition of the securities or the property of the said Troy steel plant, and whether the same shall be vested in one of the subsidiary companies; and if so, which one.

In the report of the Commissioner of Corporations (p. 289) it is said:

The price paid for this concern was $1,100,000. The company had been unsuccessful, and, in fact, had been sold under reorganization in August, 1895. John D. Rockefeller and H. H. Rogers, both of whom were at that time directors in the United States Steel Corporation, were interested in the Troy Steel Products Co. It is impossible to say whether this connection with the two concerns had any influence upon the purchase or upon the price paid, but it is proper to repeat that the plant had been idle for several years prior to this transfer, and that it was never operated by the Steel Corporation. It should be stated, however, that the stockholders of the Steel Corporation were specifically advised of the connection of these directors with the Troy concern in a notice of a meeting at which this transaction was submitted to them, and they approved of the purchase.

In the minutes of the H. C. Frick Coke Co. (directors, Jan. 22. 1896), it appears that the securities of the Troy Steel Co., being the first mortgage bonds, $20,000, and certificates of debentures, $4,526.76, which were in settlement of our claim against the Troy Steel & Iron Co. for $6,526.76, were examined by the members of the board and approved.

The Troy Steel Products Co. was the successor of the Troy Steel & Iron Co. (Report of Commissioner of Corporations, 255). It is said in the Report of the Commissioner of Corporations (p. 289):

The company was unsuccessful, and in August, 1895, was sold to a reorganization committee. In 1896 the steel works were removed to Breaker Island; the capacity of the plant at this time was about 200,000 tons of slabs and skelp per annum. After this transfer of the steel works, however, the plant was operated only a few months.

The purchase by the United States Steel Corporation was made in 1902; * * * the plant was never operated by the Steel Corporation. The steel works were dismantled in 1907. The blooming mill was removed to the South Chicago works of the Illinois Steel Co., and the blast furnaces were then standing idle.

In the minutes of the executive committee of the Steel Corporation (Nov. 18, 1901), the following appears:

The Troy Iron & Steel Co.—On the question of whether or not the ownership of this company would be advantageous to the United States Steel Corporation, the president stated that he does not believe it is of any value to us. Mr. Converse said that the Carnegie people can deliver material on the docks of the Troy Co. not only cheaper than it can be made there but at a good profit.

On motion, duly seconded, it was unanimously voted that the president be requested to decline to entertain the proposition concerning the Troy property.

According to the minutes of the finance committee, August 26, 1902 (Mr. Perkins in the chair), it appears that the Troy plant at Breaker Island is to be purchased at not exceeding $1,000,000; and in the minutes of the finance committee, December 9, 1902 (Mr. Perkins in the chair), the purchase of the Troy Steel Co. for $1,100,000 was approved. In the minutes of the American Steel & Wire Co., directors of March 20, 1906, the following appears:

Absorption of Troy Steel Products deficit.

Resolved, That the action of the officers of this company in arranging for the absorption in the profit and loss account of this company, as of December 30, 1905, of the net operating deficit for 1905 (amounting to $17,028.69) of the Troy Steel Products Co., this company being the beneficial owner of said company's capital stock, be, and the same hereby is, in all respects ratified and approved.

In the minutes of the American Steel & Wire Co., directors, March 10, 1903, it is stated that the shortage of coke makes it impossible at present to operate the Troy plant.

In the minutes of the executive committee of the Steel Corporation, April 21, 1903, it is stated that the chairman said that when we were urged to buy this property the conditions were quite different from what they are at the present time; that a special committee had re-

ported a certain value to this property and a certain cost of production; that the conditions have changed at the present time; and that he does not think it would be advantageous to go ahead simply for the purpose of supplying the plants at Worcester and Pencoyd.

Attention should be directed to the report of the Commissioner of Corporations (pp. 255–256, 289), partially extracted above, which show that the plant was only operated a few months after the transfer of the ownership in 1896; that the company had been unsuccessful; that the Steel Corporation never operated the plant; and that, as appears in the Frick Co. minutes, the securities were transferred to the Frick Co. for its claim against the Troy concern, and also to the minutes of the executive committee November 18, 1901, just quoted.

Upon the facts above stated, it is clear that the acquisition of the Troy plant did not increase the efficiency of the Steel Corporation's organization, and the only discernible result of the acquisition was to displace independent ownership and control by the ownership and control of the Steel Corporation, at a cost of $107,291.70 in cash and a note dated January 1, 1906, for $1,100,000, payable in cash or second-mortgage bonds of the United States Steel Corporation during the year 1903, bearing 5 per cent interest (minutes of the directors of the American Steel & Wire Co. Feb. 17, 1903), and the assumption of a net operating deficit by the American Steel & Wire Co. of $17,028.69 in March, 1906. Assuming that this money was not uselessly expended, the only return received for it appears to be the removal of the Troy concern from the control of outside and probably competing owners.

The Standard Oil Co. was not only a possible competitor, but had declared, through Mr. Rogers, its purpose of constructing its own pipe mills. At the meeting of the executive committee July 15, 1902 (United States Steel Corporation), it appears—

> that Mr. Rogers had stated that his company would construct its own pipe mills if arrangements satisfactory to his company could not be made with us.

And it appears that a year before, on April 30, 1901, a subsidiary company of the Standard Oil Co., i. e., the National Transit Co., received a lower price from the Carnegie Steel Co. In fact, Mr. Bope, of the Carnegie Steel Co., said, referring to this:

> Personally, I think these prices are too low, but knowing the connection of the Standard Oil Co. with the new organization, and that it is the wish of President Schwab that these people be properly treated, I think some concessions should be made to Mr. Arnold,

(who represented the National Transit Co.); and a price of 1.50 cents was given to the National Transit Co.

Furthermore, it should be noted that the Troy plant had a capacity in 1896 of "about 200,000 tons of slabs and skelp." This production was suited for pipe manufacture.

Certain dates in connection with the dealings with the Troy concern are significant, viz:

November 18, 1901, it appeared that the executive committee of the United States Steel Corporation did not consider the property advantageous to the United States Steel Corporation, and it is said:

On the question as to whether or not the ownership of this property would be advantageous to the United States Steel Corporation, the president stated that he does not believe it is of any value to us. Mr. Converse said that the Carnegie people can deliver material on the wharf of the Troy company, not only cheaper than it can be made there, but at a good profit.

On motion duly seconded it was unanimously voted that the president be requested to decline to entertain the proposition concerning the Troy property.

July 15, 1902, it appears Mr. Rogers had stated that his company would construct its own pipe mills if arrangements satisfactory to his company could not be made with us. (U. S. S. C. executive committee, July 15, 1902.)

July 15, 1902, the executive committee of the United States Steel Corporation approved the sale of plates for a period, at 5 per cent below prevailing prices, to the Standard Oil Co.

September 23, 1902, National Tube Co. has a stock of 40,000 tons of merchant pipe on hand, 25,000 tons more than last year—

and that up to the last three years they have not been after the outside competitors, but at the last meeting of the tube company a plan of action was formulated in such a way as to give the tube company a call on the business; they could let it go, if necessary, or take the business if they wanted to do so. Outside of that, their position for this time of year is very good. (Executive committee, United States Steel Corporation.)

August 26, 1902, it appears that the Troy plant is to be purchased at not exceeding $1,000,000. (Finance committee, United States Steel Corporation.)

December 9, 1902, purchase of Troy Steel Plant for $1,100,000 approved. (Finance committee, United States Steel Corporation.)

February 17, 1903, Troy plant bought by American Steel & Wire Co. for $107,291.70 in cash and note for $1,100,000 at 5 per cent, payable in 1903.

Troy steel plant was never operated by the United States Steel Corporation, and had not been operated for about five years before the formation of the United States Steel Corporation. (Report of Commissioner of Corporations on Steel Industry, July 1, 1911, p. 289.)

March 20, 1906, operating deficit, $17,028.69, was assumed by the American Steel & Wire Co.

The plant was dismantled in 1907 and part of the machinery removed to Chicago. (See report of Commissioner of Corporations, supra.)

6. Plants bought or acquired and not operated, or, for which after such acquisition, new and better plants were substituted.

I. The Carnegie Steel Co., the American Steel & Wire Co., the American Sheet & Tin Plate Co., the National Tube Co., as well as the American Bridge Co., discontinued the operation of a large number of plants shown in the statement of the United States Steel Corporation, submitted with my letter of December 4, 1911, wherein it will be seen that most of them are said to be of great age and generally unfit for operation within varying periods after the acquisition of them by the companies that held them, and the subsequent acquisition of control thereof by the United States Steel Corporation.

II. A number of plants, referred to below, were bought by the American Bridge Co. for a very large consideration, and within a comparatively short time thereafter a considerable number of these plants discontinued operation, were dismantled, leased, or sold, or were not operated by the Steel Corporation.

Within a comparatively short time after acquiring the independent plants named below for the very large consideration paid for them, the Steel Corporation planned and started the construction of new plants, making large additional expenditures for such new plants. (See minutes, directors American Bridge Co. of New Jersey, Feb. 21, 1901; Oct. 29, 1902; and Dec. 18, 1902.)

If it shall be claimed that it was cheaper for the Steel Corporation to acquire the old machinery and the tangible assets of the formerly independent concerns controlled by the American Bridge Co., rather than immediately to build new plants, such fact undoubtedly supplies a reason for acquiring these existing plants before constructing new plants to take their places. But if—as seems to be the case—a large part of the money paid for these old existing plants was paid for the good will of such plants, and also the expected combination or merger value (aside from the value of the old machinery and tangible assets combined together) it is difficult, if not impossible, to avoid the conclusion that the acquisition of the control of these existing plants, which were in such shape as to justify their discontinuance within a few years, had no cause or reason, except the purpose to take them out of independent control. In other words, the plan and purpose of establishing large new plants, concentrating a large capacity in each of them, could not have been aided by the purchase of the machinery and assets of smaller and older plants in widely separated parts of the country, which were in such condition that it was thought advisable to discontinue them within a short time after they were purchased.

The intention of the organizers of the American Bridge Co. of New Jersey in contracting to obtain control of the 36 concerns named in the minutes of the directors of that company dated May 4, 1900, and the intention of those in control of the United States Steel Corporation in subsequently absorbing the American Bridge Co., is greatly illuminated by the eighth paragraph of the contract between the American Bridge Co. of New Jersey and I. Gifford Ladd, approved May 4, 1900 (Min. Dir. Am. B. Co. N. J.), which reads as follows:

Eighth. The party of the first part further agrees to procure and to deliver to the Bridge Co. proper agreements in writing and in form acceptable to the Bridge Co., executed by himself and the persons formerly connected as owners or stockholders with the plants sold and transferred to the Bridge Co. hereunder who may be designated by the Bridge Co. within 10 days from the dates as of which possession of said plants, respectively, shall be delivered to the Bridge Co., to the effect that the said party of the first part and said persons, respectively, will not during the period of 20 years, directly or indirectly, without the consent in writing of the Bridge Co., engage or be interested in the business of bridge building or manufacturing or selling structural iron and steel, either individually or as copartners in any firm, or as agents for others, or as officers, directors, or stockholders of any corporation or association other than the Bridge Co. or its successors, in any State, District, or Territory of the United States or any of its possessions, except the Territory of New Mexico.

The United States Steel Corporation, by obtaining control of the American Bridge Co. of New Jersey, got the power to enforce this contract for 20 years, excluding from competition all of the individuals connected as owners or stockholders with the 36 odd concerns absorbed by the American Bridge Co. of New Jersey who signed this contract.

It appears also that on May 31, 1911, Mr. Roberts, formerly in the structural-steel business in the Pencoyd Works and considered by Mr. Gary as an expert in all lines of steel manufacture (3–107), said that the bridge companies outside of the American Bridge Co., as they were not combined together, "did not amount to much in a competitive way" (U. S. S. C., Ex. Com. Min., May 13, 1901), and the plan of Mr. Conger to combine them was not encouraged (id., May 6 and May 13, 1901).

(A) *Plants acquired.*—Arrangements were made by the American Bridge Co. of New Jersey in May, 1900, to acquire a large number of plants, some of which were the following:

Edge Moor Bridge Works.
Post & McCord.
Berlin Iron Bridge Co.
Groton Bridge & Manufacturing Co.
Lassig Bridge & Iron Works.
Buffalo Bridge & Iron Works.
The New Columbus Bridge Co.

Pittsburg Bridge Co.
Melton & Buchanan Co.
The Lafayette Bridge Co.
The Gillett-Herzog Manufacturing Co.
Elmira Bridge Co. (Ltd.).
Wrought Iron Bridge Co.
Youngstown Bridge Co.
Koken Iron Works.
The Union Bridge Co.
The A. & P. Roberts Pencoyd Works.
The American Bridge Works.
The Rochester Bridge & Iron Works.
The Hilton Bridge Construction Co.
Detroit Bridge & Iron Works.
The Keystone Bridge Works—Carnegie Steel Co.
Schultz Bridge Co.
J. G. Wagner Co.
Schiffler Bridge Co.
The Horseheads Bridge Co.

And also of the—

American Bridge Works, located at Chicago, Ill.
The Bellefontaine Bridge Co.
Canton Bridge Co.
Chicago Bridge Co.
J. B. & J. M. Cornell.
King Bridge Co.
New Jersey Steel & Iron Co., Trenton, N. J.
Passaic Rolling Mill.
Penn Bridge Co.
Pittsburg Bridge Co.
Toledo Bridge Co.
Wisconsin Bridge & Iron Co.

(See minutes directors American Bridge Co. of New Jersey, May, 1900.)

(B) *Valuation and consideration paid for various plants.*—In the minutes of the American Bridge Co., directors, May 4, 1900, it appears that—

The committee on the purchase of the properties offered for sale by Mr. Ladd presented the report of the committee, consisting of Messrs. E. H. McCord, Frank Conger, Charles M. Jarvis, and F. M. Wyant, four gentlemen of reputation and ability, and great experience in the bridge-building and structural-iron business, and that the said committee has received from them the following report as to the value of said plants.

(Here follows a list of plants referred to above, Nos. 1 to 35. See list, pp. 4167–4168, minutes of American Bridge Co.)

We are familiar with the foregoing properties of plants and the business which has been carried on therein. We are of opinion that no more desirable or more modern or highly equipped plants could be purchased by your company in connection with its proposed business. We have no hesitation in stating as

our opinion of their collective value that the said plants, exclusive of materials, supplies, and contracts, are worth at least the sum of $61,000,000.

We have read the report of Mr. Stephen Little to Mr. I. Gifford Ladd, dated this day, concerning the earnings of certain plants referred to in said report and the business transacted therein, and of the usual profits in the business. We beg to state that we fully concur with Mr. Little's conclusion that the net manufacturing profits of such plants that he enumerates for the year 1900 should be upward of $6,000,000.

Yours, truly,

FRANK CONGER.
F. M. WYANT.
WM. H. MCCORD.
CHAS. M. JARVIS.

It was agreed to issue for 35 of the plants referred to above $20,499,000 par value preferred stock and $34,999,000 par value of the common stock of the American Bridge Co., together with the sum of $5,500,000 in cash.

The committee further reported that these plants, works, and properties, and shares of stocks and bonds were in their opinion necessary for the objects and business of the company and were fully worth (exclusive of supplies, materials, and contracts) the proposed purchase price of $60,098,000, and they recommended that Mr. Ladd's proposition be accepted and that said agreement be entered into for carrying out the agreement for the purchase; and a resolution adopting these views of the committee and providing for the purchase was carried. (Minutes directors American Bridge Co., May 4, 1900.)

It appears by the minutes of the American Bridge Co., May 10, 1900, that Mr. Ladd found himself unable to deliver certain properties, to wit, the plants of the Bellefontaine Bridge Co., Canton Bridge Co., Chicago Bridge Co., J. B. & J. M. Cornell, King Bridge Co., New Jersey Steel & Iron Co., Passaic Rolling Mill Co., the Penn Bridge Co., Toledo Bridge Co., and Wisconsin Bridge & Iron Co., and that a committee as appraisers, consisting of Louis L. Stanton, Frederick P. Voorhees, and Edward M. F. Miller, determined that $4,772,200 preferred stock and $4,772,200 common stock should be withheld from Mr. Ladd on account of the present inability to deliver these properties.

Later Mr. Ladd proposed to deliver 11,995 shares, being the entire capital stock (except the shares to qualify directors) in the Detroit Bridge & Iron Works, and 1,995 shares, being all the capital stock (except shares to qualify directors) of the Koken Iron Works, and that for these properties and a large number of plants named above there was paid to Ladd the sum of $5,500,000 in cash and certificates for 157,268 shares of the preferred stock and 302,208 shares of the common stock of the American Bridge Co. of New Jersey.

In the minutes of the directors of the American Bridge Co., May 21, 1900, it appears that it was determined by the appraisers above

named that out of the sum withheld because of the nondelivery of certain plants named that $400,000 of the preferred stock and $300,000 of the common stock should be delivered to Ladd upon the delivery of the property of the New Jersey Steel & Iron Co. to the American Bridge Co.

Arrangements were also made to pay certain sums for materials, and so forth, connected with plants to be transferred to the bridge company.

In the minutes of the directors of the American Bridge Co., January 17, 1901, it appears that there was presented an agreement for the purchase of 1,000 shares (except only a sufficient number to qualify directors) of the Alabama Bridge & Iron Co.

The purchase of 2,500 shares, being all the outstanding stock (except sufficient shares to qualify directors) of the Toledo Bridge Co., for the sum of $1,050,000, payable as follows: $700,000 in preferred stock and $350,000 in common stock of the American Bridge Co. of New Jersey, and the assumption of the debts of the Toledo company was ratified and approved. A statement referred to shows that the capital stock of the Toledo Bridge Co. was $250,000, its total assets $606,586, and unpaid dividends $18,375. (Minutes directors American Bridge Co. of New Jersey, Apr. 18, 1901.)

The American Bridge Co. subscribed to 1,000 shares of the Canadian Bridge Co. at $100 a share. (Minutes of directors of American Bridge Co. of New Jersey, May 16, 1901.)

The American Bridge Co. of New Jersey leased the plants of the New Jersey Steel & Iron Co. for an amount equal to 50 per cent on the dividends on the stock of the New Jersey company.

The Empire Bridge Co. bought from the American Bridge Co. of New Jersey its Albany plant, Brooklyn plant, Buffalo plant, Elmira plant, Groton plant, Horseheads plant, and Rochester plant for $2,996,500 par value of the capital stock of the Empire Bridge Co. (See minutes directors American Bridge Co. of New Jersey, Oct. 28, 1901.)

The Detroit Bridge & Iron Works was purchased for $600,000. (Minutes directors American Bridge Co. of New Jersey, Nov. 12, 1901.)

The Keystone Bridge plant was acquired by the American Bridge Co. for $2,000,000 preferred stock and $1,000,000 of common stock April 23, 1900. (Carnegie Co. Dir. Min. Apr. 23, 1900.)

The stock of the American Bridge Co., including $31,348,000 of preferred stock and $30,946,400 common stock, or $62,294,400 in all, was exchanged for $34,482,800 preferred and $32,493,720 common stock, or $66,976,520 in all, of the United States Steel Corporation; but this capitalization was reduced after Steel Corporation got the property to only $10,000,000.

The United States Steel Corporation acquired the stock of the American Bridge Co. on or about April 1, 1901. (See U.S.S.C.Dir., 3d meeting, Apr. 1, 1901.)

(C) *Expenditures for and establishment of new plants.*—The consolidation of five plants at Pittsburgh was suggested, according to the minutes of the directors of the American Bridge Co., February 21, 1901.

On October 29, 1902, it was resolved to construct the Ambridge plant at Economy, Pa., to cost $2,677,000. (Minutes directors American Bridge Co. of New Jersey.)

In February, 1903, the Gary and Ambridge plants were under construction, as is stated in the statement made by the United States Steel Corporation giving reasons for abandonment of plants (see my report Dec. 4, 1911) in connection with Schultz plant.

(D) *Discontinuance of plants.*—On June 20, 1901, it was resolved that the Groton plant be shut down as soon as it can be done consistently with the work now in process of manufacture at that plant. (Minutes directors American Bridge Co. of New Jersey.)

On September 20, 1901, it was resolved that the American Bridge Co. of New Jersey approve of the dissolution of the Alabama Bridge & Iron Co.

In October, 1901, the Groton plant was abandoned, and the reason for abandonment given in the statement of the United States Steel Corporation, submitted with my letter of December 4, 1911, to the committee, was as follows: "Poorly located and costs too high to economically operate."

As to this Groton plant, as well as to five others of the plants mentioned below, the statement above referred to presents the following additional reason for abandonment:

> The tonnage output of these six plants, abandoned because they were old, obsolete and no longer profitable to operate, was transferred to and taken care of by the new, modern, and up-to-date plant constructed by the company at Elmira, N. Y. These six old plants served largely central and northern New York State and New England. Elmira was chosen as the point of concentration, as nearly all raw steel from Pittsburgh for above territory is shipped through Elmira. The new plant at Elmira has a capacity of 54,000 gross tons annually.

The Groton plant is stated by the Steel Corporation to have been built in 1880, and was therefore 20 years old when bought or acquired in 1900 by the American Bridge Co., for the consideration, as above stated, of over $60,000,000, in connection with the other plants above named.

On November 11, 1902, the sale of the Walker plant was recommended. (Minutes executive committee United States Steel Corporation.)

On December 30, 1902, the abandonment of the Rochester plant and the sale of the property at the best price obtainable was recommended. (Minutes finance committee United States Steel Corporation.)

In April, 1903, the Rochester plant at Rochester, N. Y., said by the Steel Corporation to have a tonnage capacity of 6,400 tons at that date, was abandoned. The reason given by the Steel Corporation is: "Very old and obsolete; buildings are ready to fall down; could not operate profitably."

This plant was also one of the five plants as to which the explanation was made as quoted above with relation to the Groton plant.

It is stated in the statement by the Steel Corporation that the Rochester plant was built in 1872, and it was therefore 38 years old when it was bought in 1900.

On July 24, 1903, the Schultz plant fixtures were sold and plants in the vicinity of Pittsburgh were abandoned, in conjunction with the construction of the Economy plant, known as the Ambridge plant, at Economy, Pa.

On September 17, 1903, it was resolved to dismantle the Albany plant. (Minutes directors Empire Bridge Co.)

In December, 1903, the Pittsburgh plant, Pittsburgh, Pa., which is said by the Steel Corporation to have had an annual tonnage capacity at that date of 16,000 tons, was abandoned. The reason given by the Steel Corporation as to this plant and the Walker plant, abandoned April, 1904, and the Youngstown plant, abandoned May, 1904, was:

> These were all Pittsburgh district plants. All except the Walker plant were old and very much run down, especially was this the case with the largest one—Keystone. It was of an obsolete type and production cost excessively high. Instead of rebuilding any or all of these plants it was concluded to concentrate the output at a single plant in the Pittsburgh district. Accordingly the Ambridge plant (near Pittsburgh) was constructed and all available equipment and facilities of the old plants removed to it. The Ambridge plant is modern in every particular, and has an average capacity of 200,000 gross tons of finished fabricated material.

It is stated by the Steel Corporation that the Pittsburgh plant was built in 1878, so that in 1900, when bought or acquired by the American Bridge Co. it was 22 years old.

In March, 1904, the Albany plant, Albany, N. Y., was abandoned, and the reason stated in the statement of the Steel Corporation is: "Plant too small to permit profitable operation. Location and area of site preclude building on enlarged scale."

And there was also added the explanation which was made in reference to the Groton plant above.

The Albany plant was built in 1880, as stated by the Steel Corporation, it was therefore 20 years old when bought or acquired by the American Bridge Co. in 1900.

In April, 1904, the Horseheads plant, Horseheads, N. Y., was abandoned, and the reason stated in the statement of the Steel Corporation is: "Very small plant; too expensive to operate. Tonnage output taken care of by new Elmira plant," and the explanation made with reference to the Groton plant above was also referred to. In the statement of the Steel Corporation it appears that the Horseheads plant was built in 1890, and it was therefore 10 years old when bought or acquired by the American Bridge Co.

In April, 1904, the Buffalo plant, Buffalo, N. Y., was abandoned, and the same reason for abandonment is set opposite this plant in the statement of the Steel Corporation as that given for the Pittsburgh plant. The Buffalo plant was built, as shown by the Steel Corporation's statement, in 1893, and was therefore 7 years old when bought or acquired by the American Bridge Co. in 1900.

In April, 1904, the Walker plant, Pittsburgh, Pa., was abandoned, and the same reason for abandonment is shown in the statement of the Steel Corporation as that given for the Pittsburgh plant. It appears in the statement of the Steel Corporation that the Walker plant was built in 1899 and had an annual tonnage capacity at the date when abandoned of 15,000 tons, and when abandoned was 5 years old.

In May, 1904, the Youngstown plant, Youngstown, Ohio, was abandoned, and the same reason for abandonment is set forth in the statement of the Steel Corporation as that given with reference to the Pittsburgh plant. It is stated in the statement of the Steel Corporation that the Youngstown plant was built in 1889, and it was therefore 11 years old when acquired by the American Bridge Co.

In May, 1904, the La Fayette plant, La Fayette, Ind., was abandoned. The reason for abandonment given in the statement of the Steel Corporation is: "These were small highway-bridge plants; they were poorly arranged and their costs were high" (referring also to the Columbus plant, Columbus, Ohio). An extension was built to the Canton, Ohio, plant, and the tonnage capacity of the two plants were transferred to and taken care of at that point. In the statement of the Steel Corporation it appears that the La Fayette plant was built in 1891. It was therefore 9 years old when purchased by the American Bridge Co.

In February, 1905, the Keystone plant, Pittsburgh, Pa., was abandoned. It is stated in the statement of the Steel Corporation that the Keystone plant was built in 1865, and it was therefore 35 years old when bought or acquired by the American Bridge Co.

In February, 1905, the Columbus plant, Columbus, Ohio, was abandoned, and the statement of the Steel Corporation gives the same reason for abandonment as is stated above with reference to the La Fayette plant. It appears in said statement that the Columbus plant was built in 1886, and it was therefore 14 years old when bought or acquired by the American Bridge Co.

In December, 1907, the Athens plant, Athens, N. Y., was abandoned. The statement of the Steel Corporation gives the reason for abandonment as follows: "Plant old and obsolete; buildings dangerous, production costs high. Instead of rebuilding transferred output to new Elmira plant as explained," and also refers to the explanation given above with reference to the Groton plant.

By the said statement it appears that the Athens plant was built in 1869, and it was therefore 31 years old when bought or acquired by the American Bridge Co.

In March, 1909, the Berlin plant at East Berlin, Conn., was abandoned. The statement of the Steel Corporation gives the same reasons for abandonment as those given in connection with the Athens and Groton plants above. By the said statement it appears that the Berlin plant was built in 1869, and was therefore 31 years old when bought or acquired by the American Bridge Co.

In February, 1903, the Schultz plant, McKees Rocks, Pa., was said to be destroyed by fire. By the statement of the Steel Corporation it appears that the Schultz plant was built in 1856, and it was therefore 44 years old when bought or acquired by the American Bridge Co., and it stood entirely upon leased ground. "Moreover, the tonnage capacity of these plants was taken care of by the new plants at Ambridge and Gary which were under construction at the time of the respective fires."

It also appears by the said statement that the Milwaukee plant was built in 1875, and was therefore 25 years old when bought or acquired by the American Bridge Co.

On March 15, 1910, it was resolved to sell the Alabama plant at New Decatur, Ala., for not less than $14,000. (Minutes directors American Bridge Co. of New Jersey.)

On March 15, 1910, it was resolved to sell the Toledo, Ohio, plant, for not less than $5,500. (Minutes directors American Bridge Co. of New Jersey.)

For this plant $1,050,000 had been paid two months after the Ambridge plant was planned.

7. In addition to the plants acquired in the early part of the consolidation and those referred to above, a number of plants were bought which were engaged in the steel business and allied lines in the nine years of existence of the Steel Corporation.

Isolatedly considered, the purpose in acquiring independent concerns may be entirely colorless, but when considered in connection with the acquisition of other independent plants, admittedly or inferably to terminate competition, the continued policy and practice of acquiring control of companies engaged in its own lines of business may be corroboratory of the conclusion that the intention was to prevent competition of the concerns acquired, if not per se indicative of such intention.

I. The Clairton Steel Co. was bought by the United States Steel Corporation for $1,000,000, par value of second-mortgage bonds (bought in the open market at $813,850), and in addition the United States Steel Corporation guaranteed the outstanding bonded indebtedness of the Clairton Steel Co., the St. Clair Furnace Co., and the St. Clair Steel Co., amounting to $10,230,000.

Through the acquisition of the Clairton Steel Co. the United States Steel Corporation obtained a contract from the Crucible Steel Co., which formerly controlled the Clairton Co., in which the Crucible Co. agreed that the leading interests would not engage in competitive business. Before the acquisition of the Clairton Steel Co. by the United States Steel Corporation the Clairton Co. made steel billets for the Crucible Steel Co. Thus the Clairton Co., to this extent at least, competed with the United States Steel Corporation in supplying a large customer. By the acquisition of the Clairton Steel Co. the United States Steel Corporation removed it as a competitor and transferred to itself, by the agreement above referred to, the trade of the Crucible Steel Co. The contract provided that the Crucible Co. should get its total requirements from the United States Steel Corporation. (See minutes, United States Steel Corporation, Mar. 19, 1903; Carnegie Steel Co. directors, May 2, 1904; and the United States Steel Corporation directors, May 3, 1904.)

It is of interest in considering the effect of the acquisition of the Clairton property to note that it was stated in the minutes of the directors of the Carnegie Steel Co. (July 24, 1905) that that company could build a mill at Clairton for $300,000, in 60 days, which would pay for itself in 2 months.

II. The Tennessee Coal, Iron & Railroad Co. was acquired by the United States Steel Corporation for $48,961,208.83, or, adding cost of contruction work, November and December, 1907, at a total cost of $49,946,095.57.

It was claimed great expense had to be incurred to make it profitable; that its cost was high (Frick estimated the shares as worth

65, whereas par was paid for them); that its resources were undeveloped, and its plant needed much improvement; that it had sold rails to Harriman at less than cost; and, in general, that its value consisted greatly in its possibilities, rather than its actual efficiency as a going concern. If these claims be true, it makes it still more difficult to explain the purpose underlying its acquisition, if, as urged by representatives of the Steel Corporation, any intent to benefit by the removal of its possibilities from the competitive field must be excluded from the consideration.

It may not be possible succinctly to state the true intention in acquiring the Tennessee company, in a way which would be admitted by the men in control of the Steel Corporation, inasmuch as it appears to many experienced men who are also disinterested that the intention which impelled its acquisition was merely the desire to bring under the control of the Steel Corporation the great possibilities for competition possessed by the Tennessee company. The consequences of the acquisition should and must be held to have been intended, even if the result so deduced conflicts with the intention declared to be in the minds of those responsible.

III. Wyman & Gordon and H. W. Wyman were paid $25,000 to withdraw from the rail bond business. (A. S. W. Co. Dir. Min., Sept. 9, 1902.)

IV. The Trenton Iron Co. was acquired by the United States Steel Corporation (U. S. S. C. Fin Com., July 5–Sept. 27, 1904). This company was said to be listed in the red book of the Wire Rope Association (10–574), and its plant consisted of a wire-rod mill and a wire works for the manufacture of wire rope and similar products, with a yearly capacity for the rod mills of 18,000 gross tons (Report Com. Corp., p. 256), which company was also alleged to have been a participant in the Wire Rope Association from January, 1908, to January, 1909 (Government bill of complaint, pp. 51–52), and the existence of which association between January, 1908, and January, 1909, was admitted. (Answer United States Steel Corporation, pp. 41–42.)

Viewing the production and efficiency of this plant, the Commissioner of Corporations says it was insignificant compared to other acquisitions by the United States Steel Corporation. The Steel Corporation nevertheless considered the concern of sufficient importance to acquire control of it for $500,000 cash. (July 5–Sept. 27, 1904, U. S. S. C. Fin. Com. Min.)

V. The contract for the acquisition of the Union Steel Co. (which is referred to above) was made between the United States Steel Corporation and Messrs. A. W. Mellon, R. B. Mellon, W. H. Donner, William Flinn, George W. Darr, John Stevenson, jr., and J. P.

Whitla, as the vendors, on December 15, 1902, and, among other things, after authorizing an issue of capital stock of $20,000,000 and of $45,000,000 of bonds, provides:

Tenth. The vendors severally agree with the steel company that they respectively will not within the United States or the Dominion of Canada for a period of 10 years from December 1, 1902, engage directly or indirectly in the manufacture of iron or steel or articles made therefrom now manufactured by the steel company, the production of furnace coke, or the mining or production of iron ore, except in the Territory of Arizona and State of Florida; excepting, however, from the terms hereof the enterprises, if any, in which parties may now respectively be engaged.

And by paragraph 11 of the agreement it was stipulated that the individuals named have no ore properties other than those owned by the Union and Sharon concerns.

VI. It was seen that the contract with the Crucible Co. provides that the leading interests would not engage in competitive business, and the Crucible Co. would take all their requirements from the United States Steel Corporation, and by the contract between the Crucible Steel Co. and the Carnegie Steel Co., April 30, 1904, the Crucible Co. in buying Bessemer and basic pig iron and Bessemer and basic billets agreed:

Eighth. It is made a condition of this contract that the buyers shall not resell any of the material furnished hereunder without first putting it through a process of manufacture at their works.

VII. A contract was also made with Pittsburg Steel Co. by the Carnegie Steel Co., approved by the United Steel Corporation to supply their entire supply of billets, etc. (U. S. S. C. Fin. Com., Apr. 11, 1905, U. S. S. C. Dir., Apr. 25, 1905), and contained a restrictive covenant similar to that just quoted as to the contract with the Crucible Co.

VIII. The United States Steel Corporation paid $18,500,000 in its stock for a one-sixth interest, representing $421,700 in the stock of the Oliver Iron Mining Co. The one-sixth interest had been held by the Oliver & Snyder Steel Co. This interest had been held by an independent company, and its acquisition terminated its right to mine this ore. This one-sixth interest had been held at a much less valuation, and in fact the five-sixths already owned was carried at $2,167,000 on the books of the Carnegie Co., as appeared by an affidavit of its auditor, J. J. Campbell. (See Rept. Com. Corp., pp. 114, 156, 157, 187.)

IX. The concern controlled by Mr. Oliver contracted with the United States Steel Corporation, through one of its subsidiaries, to exchange its coke for the Steel Corporation's billets, and this contract is said in the minutes to have the effect of removing the Oliver concern as a competitor in selling coke. (U. S. S. C. Ex. Com., May 2, 1901.) See also minute of similar contract with Oliver Iron & Steel Co. in minutes of directors of Carnegie Steel Co., June 27, 1904.

X. The contract between the Carnegie Steel Co. and the American Tinplate Co. entered into in January, 1899, and precluding competition between them until after 1903; the contract of the Carnegie Steel Co. to remain out of the bridge-building business; the contract of the American Steel Hoop Co. to pay the Illinois Steel Co. to stay out of the cotton-tie business; the structural-steel agreement, whereby the New Jersey Iron & Steel Co. were paid $5,000 a month to abstain from making certain structural steel should all be referred to here, because the operation of these contracts has been perpetuated in substance by the consolidation of these concerns. These agreements between two or more of the concerns consolidated into the United States Steel Corporation must also be kept in mind if we desire to understand the intention underlying the later acquisitions of interests in other concerns by the various subsidiary companies.

XI. As we saw above (par. 6, Subd. II), the acquisition of the American Bridge Co. gave the United States Steel Corporation the benefit of enforcing the contract approved in connection with the acquisition of the thirty-six-odd bridge plans named in the minutes of the American Bridge Co. of New Jersey directors May 4, 1900, which provided, among other things, as follows:

"Eighth. The party of the first part further agrees to procure and to deliver to the bridge company proper agreements in writing and in form acceptable to the bridge company, executed by himself and the persons formerly connected as owners or stockholders with the plants sold and transferred to the bridge company hereunder, who may be designated by the bridge company, within 10 days from the dates as of which possession of said plants, respectively, shall be delivered to the bridge company, to the effect that the said party of the first part and said persons, respectively, will not, during the period of 20 years, directly or indirectly, without the consent in writing of the bridge company, engage or be interested in the business of bridge building or manufacturing or selling structural iron and steel, either individually or as copartners in any firm or as agents for others, or as officers, directors, or stockholders of any corporation or association other than the bridge company or its successors, in any State, District, or Territory of the United States, or any of its possessions, except the Territory of New Mexico."

The United States Steel Corporation, by obtaining control of the American Bridge Co. of New Jersey, got the power to enforce this contract, excluding from competition for 20 years all of the individuals connected as owners or stockholders with the thirty-six-odd concerns absorbed by the American Bridge Co. of New Jersey, who signed this contract.

It appears also that in May 31, 1911, that Mr. Roberts, formerly in the structural steel business in the Pencoyd works, and considered by

Mr. Gary as an expert in all lines of manufacture (3–107), said that the bridge companies outside of the American Bridge Co., as they then were not combined together, "did not amount to much in a competitive way" (U. S. S. C. Ex. Com. Min., May 13, 1901), and the plan of Mr. Conger to combine them was not encouraged (id., May 6 and May 13, 1901).

As stated above, the acquisitions isolatedly considered may be of little significance, but they must be viewed in their collective effect.

8. A list of the plants and securities of companies in various lines of business related to that of the United States Steel Corporation and its subsidiaries which have been acquired by the United States Steel Corporation in the nine years and nine months of its existence, or by its subsidiary companies (in addition to those enumerated above) will be set out hereunder as far as the same can be made up from extracts from the minute books; but a complete list will be requested from the United States Steel Corporation, and will be submitted in a supplement to this report.

An investigation of the proportion of the consideration paid in each case, which was in compensation for tangible assets, as compared to the proportion which was in compensation for intangible elements of value, which more readily, if not entirely, embrace the competitive possibilities, features, and activities of the acquired concerns, will be conceded to be important in any complete or valuable investigation, in view of the pronouncement of the Commissioner of Corporations in his survey of the steel industry, to the effect that the three especially important features of the industrial consolidations in the steel business have been (p. 4, et seq.):

(1) The restriction of competition through combination.

(2) Integration; that is, the linking up of productive processes through acquisition under one control of raw materials and manufacturing plants (and in some cases transportation facilities) and through extensions and coordination of manufacturing processes.

(3) The creation of a great amount of inflated securities. The influence of all these factors should be kept clearly in mind. The first, namely, the restriction or elimination of competition was the most important. Undoubtedly it was the principal cause of most consolidations in the steel industry.

(P. 7.) The fundamental causes of the formation of the United States Steel Corporation were substantially the same as those which gave rise to the earlier consolidations already described, namely, restriction or prevention of competition; integration; stock inflation. The same causes, though in varying degree, were here present, and the same processes were here repeated, though in a more comprehensive manner and on a vaster scale.

If we apply these three causes of consolidation to the absorption of the plants already named and those to be referred to hereafter, we think it will be seen that in almost all cases the first cause stated—that is, restriction of competition—will offer the only sensible explanation of the absorption.

As to a few notable instances, i. e., the Tennessee Co. and the Union Co., the second element, or the acquisition of raw materials is present.

And as to the Union Co., indirectly, the third element of the issue of a great amount of inflated securities may be said to enter, in view of the facts: that the ore and coal held by that company was much overvalued; that the capacity was of no account compared to that already possessed by the Steel Corporation, or easily procurable by new construction for less expense; that the stock was increased from $1,000,000 to $20,000,000 and the bonded debt increased to $45,000,000, before the acquisition by the Steel Corporation; and the company was backed by strong financial interests in Pittsburgh, notably the Mellons and Mr. Frick and others.

But as to the acquisition of control of the Shelby, Clairton, Troy, Trenton, Griswold, and Wyman concerns, and also the—

Lamb Wire Co.,
Page Woven Wire Co.,
DeKalb Fence Co.,
Anthony Fence Company—

and the plants formerly of the—

Berlin Iron Bridge Co.,
Buffalo Bridge & Iron Works,
Groton Bridge Building Co.,
Hilton Bridge Construction Co.,
Horseheads Bridge Co.,
Koken Iron Works,
Lafayette Bridge Co.,
Pittsburg Bridge Co.,
Rochester Bridge & Iron Works,
Union Bridge Co. (Athens, Pa.),
Youngstown Bridge Co.,
Toledo Bridge Co.,
Alabama Bridge & Iron Co.,
Indiana Wire Fence Co.,
Garden City Wire & Spring Co.,
Cincinnati Barb Wire Fence Co.,
Portage Iron Co., Duncansville, Pa.,
Newburgh Wire & Nail Co.,
Puget Sound Wire Nail & Steel Co.,
Garwood Seamless Tube Co.,
Brewer Tube Co.,
Mansfield Machine Works,
United States Cold Drawn Steel Co.,
Newcastle Tube Co.,
Baltimore Tin Plate Co.,
Blairsville Rolling Mill & Tin Plate Mill,
Cincinnati Rolling Mill & Tin Plate Co.,

and the plants formerly of the—

Neshannock Sheet & Tin Plate Co.,
Hamilton & Co.,
Marshall Bros. & Co.,
Cumberland Steel & Tin Plate Co.,
Corning Steel Co.,
P. H. Laufman & Co. (Ltd.),
Pittsburg Steel Manufacturing Co.,
West Penn Sheet Steel Works,
Coshocton Rolling Mill Co.—

it seems clear that they were absorbed and consolidated for the restriction of competition, because all of these plants were immediately closed upon acquisition or not operated (Rept. Com. Corp., p. 106) or added only a negligible fraction to the Steel Corporation's efficiency compared to that already possessed or which much less expensively could be supplied by new construction or, having a small independent production, were merely removed from independent control, without appreciably affecting the existing productivity, efficiency, or integration of the Steel Corporation; and, when considered collectively with many similar instances of absorbing and combining separate small plants, lead to the conclusion that the object in view was the restriction of competition rather than either of the other two elements set forth by the Commissioner of Corporations.

In connection with these acquisitions and operations, it should be borne in mind that the aggregate cash balance of the Steel Corporation is said to have equaled $75,000,000 (3–132; 20–1425).

COMPANIES IN STEEL AND ALLIED BUSINESSES.

Canadian Bridge Co., stock control and directors to be nominated by American Bridge Co. of New Jersey by agreement with Francis C. McMath and Burnham S. Colburn (directors Am. B. Co., N. J., May 16, 1901).

Lamb Wire Co. bought by American Steel & Wire Co. (Directors' min., Apr. 21, 1902.)

Bellaire Steel Co. $150,000 of bonds of, at par or better, to be bought. (U. S. S. C. fin. com., May 6, 1902.)

Page Woven Wire Co., purchase of, was referred to committee. (Am. S. & W. Co. Dir. min. July 15, 1902.)

Youngstown Iron, Sheet & Tube Co., 2,000 shares of stock of, purchased from Frick for $211,196, promissory notes at 5 per cent five years. (U. S. S. C. fin. com., Feb. 17, 1903.)

Lowellsville Limestone Co., 51 per cent of stock and assets taken over by Mahoning Limestone Co. (C. S. Co., dir. min., Feb. 5, 1906.)

DeKalb Fence Co., entire capital stock of, and Union Fence Co., 500 shares bought for $275,000. (A. S. W. Co., dir. min., Mar. 16, 1909.)

Michigan Iron & Land Co., acquisition of 400,000 acres of, referred to committee. (U. S. S. C. Fin. Com., Dec. 22, 1909.)

Anthony Fence Co., bought for $200,000. (A. S. W. Co., dir., Jan. 21, 1910.)

American Refractories Co., application for loan of $250,000 referred to chairman and president with power. (U. S. S. C. fin. com., Sept. 27, 1910.)

J. B. & J. M. Cornell owes Carnegie Steel Co. $50,880.64, and Frederick J. Horne is to execute voting trust agreement. (C. S. Co. dir. min., July 3, 1911.)

Pittsburgh Coal Co., acquisition of 7,500 acres coking coal and River Coal Co. acquisition of 8,000 acres coking coal contract. (See 4–159.)

Cramp Ship Building & Engine Co., $500,000 subscription for 5 per cent notes of. (C. S. Co., dir. min., May 4, 1903. U. S. S. C. supplementary extract of Fin. Com., Mar. 8, 1904.)

RAILROAD COMPANIES.

Pennsylvania Co., $5,000,000, 18 months 4½ per cent notes subscribed for. (U. S. S. C. fin. com., May 15, 1906.)

New York, Chicago & St. Louis 4 per cent bonds to be bought up to $1,000,000. (U. S. S. C. fin. com., May 29, 1906.)

Union Pacific Ry. Co., $2,000,000 loaned to. (U. S. S. C. fin. com., July 24, 1906.)

Union Pacific Ry. Co., $5,000,000 loaned to. (U. S. S. C. fin. com., Aug. 14, 1906.)

9. Financial and corporate relations of the United States Steel Corporation with concerns in various lines of business similar to those controlled by the steel corporation, but which concerns are known as independent concerns.

INTERLOCKING DIRECTORS AND STOCK OWNERSHIP.

I. Stocks in 18 ginning companies were acquired by the Carnegie Steel Co. and were to be sold June 8, 1909, at a marked-down value. It is stated that "when they were acquired we did not expect that we would realize anything on them."

But it appears that the reason for acquiring the stocks is explained as follows:

These are stocks of the companies which favored square bales for cotton and used our cotton ties exclusively, and they were taken with a view to helping them along. When they were acquired we did not expect that we would realize anything on them, and as the purpose for which they were taken has now been accomplished, as evidenced by the fact that the shipments of cotton ties this year amount to about 2,500,000 bundles, we may as well sell them. I would offer a resolution, therefore, that the treasurer of this company be, and hereby he is, authorized, subject to the approval of the finance committee of the corporation, to dispose of all these stocks at the best price to be obtained.

Motion was carried.

It does not appear from the data now before us whether the finance committee of the corporation decided to part with these stocks.

II. The American Can Co. is, as far as known, wholly independent from the steel corporation, except that certain directors of the steel corporation are also directors of the can company. This is the only connection between them known.

As early as May 9, 1901, it seems to be recognized "that special prices should be voted if the American Can Co. could not succeed," because of the large amount which it bought from the American Tinplate Co., one of the subsidiaries of the steel corporation.

On April 17, 1902, the following appears:

The president stated that the glucose company were large users of tin cans and were thinking of making them themselves; that this would mean a loss of a very large tin-plate business to our tin-plate company; that the can company has received a proposition with reference to prices and the can company would like to enter into some sort of a sliding-scale agreement with the American Tin Plate Co. for this one order. The president stated that the following proposition was involved: The can company agrees to take our auditor's account of the cost of tin plate, providing we give them half of the profit we may have above the cost; they also would give us half of the profit they make above the cost. The president is not willing to do this as a general thing, but thinks it might be good policy for this one order; and that it is to our interest to tie every customer to the American Can Co. that we can. It is provided that if the can company makes a loss, we do not help to make that up. The president stated that such an arrangement will not get us into trouble with any-

one else, and that he thinks it is a splendid arrangement. It is a five-year contract.

On motion duly seconded it was voted that this be approved.

Later negotiations were referred to Corey, Gary, and Ream (Jan. 4, 1904), but the president reported (July 13, 1904) that the negotiations with the American Can Co. had been dropped, "at all events, for the present."

A five-years' contract, executed on or about April 17, 1902, would expire April, 1907, unless otherwise terminated, but it is not known what arrangements exist at present.

III. In the reference to the acquisition of the Union Steel Co. above, it will be seen that the connection of Mr. Frick with that company, he being at that time a director of the United States Steel Corporation, is referred to by the Commissioner of Corporations as an element which led to the acquisition of the Union Steel Co. by the United States Steel Corporation. It was there said, quoting from page 254 of the Report of the Commissioner of Corporations:

> There can be no doubt that the probable motive of the steel corporation was to prevent the competition which the rapidly extending operations of the Union concern foreshadowed, and especially to eliminate the rivalry of Mr. Frick.

And from same report, page 286:

> The real significance of the transaction seems to be that the steel corporation desired to eliminate the competition of certain financial interests back of the Union concern, particularly that of Mr. Frick, and that the amount necessary to induce these owners to retire from such competition was, in effect, charged against the ore and coal.

IV. In the reference to the Troy Steel Products Co. above, it appears that John D. Rockefeller and H. H. Rogers, who were connected with the Standard Oil Co., were interested in the Troy Steel Products Co. and were at that time directors in the United States Steel Corporation. It also appears above that the Standard Oil Co. had purposed to complete its own pipe mills in July, 1902 (see United States Steel Corporation executive committee minutes, July 15, 1902, statement with reference to Mr. Rogers), and that the purchase of the Troy plant was approved in December of the same year, although it was never operated.

V. In March, 1909, in the minutes of the directors of the Carnegie Steel Co., it is stated that "one inquiry is from the Argentine Republic for 34,000 tons, and as J. P. Morgan & Co. are financing the proposition this tonnage will undoubtedly come to us." It will be noted that Mr. J. P. Morgan was a director of the United States Steel Corporation at that time.

VI. In the minutes of the directors of the Carnegie Steel Co., April 30, 1901, it is stated that a price of 1.50 cents was given to Mr. Arnold of the National Transit Co. (which was a branch of the Standard

Oil Co.), which was considered too low by Mr. Bope, of the Carnegie Co., but it was stated:

Personally I think these prices are too low, but knowing the connection of the Standard Oil Co. with the new organization and that it is the wish of President Schwab that these people be properly treated, I think perhaps some concession should be made to Mr. Arnold. I should like to have the views of the board on the subject.

It appears that the price of 1.50 cents was made. It will be noted that Mr. John D. Rockefeller and Mr. Henry H. Rogers were early directors of the United States Steel Corporation.

VII. Advance payments were made to the Allis-Chalmers Co. on account of contracts set forth, as appears in the minutes of the directors of the Carnegie Steel Co., September 2, 1907, and $200,000 was loaned to the Allis-Chalmers Co. by the United States Steel Corporation upon accounts receivable and bonds. (See minutes directors Carnegie Steel Co., Sept. 2, 1907, and minutes United States Steel Corporation finance committee, Sept. 17, 1907, p. 722.)

It appears that Mr. E. H. Gary was a director in both the Allis-Chalmers Co. and the United States Steel Corporation at the times referred to.

VIII. On October 1, 1907, the finance committee of the United States Steel Corporation voted to advance to the Westinghouse Machine Co. $200,000 on account of contract. It will be noted that Mr. Converse, who was then a director of the United States Steel Corporation, is a director in the Westinghouse Electric & Manufacturing Co.

IX. And as to the United States Steel Corporation itself, one matter under this heading that has been reviewed in the evidence before this committee is summed up by the Commissioner of Corporations.

After referring to the syndicate managed by J. P. Morgan & Co., at page 245, in these words:

There can be no question that this huge compensation to the syndicate, or, in other words, the enormous block of stock upon which this profit was realized, was greatly in excess of a reasonable compensation—

The report states at page 247—

In this connection it is also proper to point out that the syndicate managers were prominently identified with the management of several of the companies acquired by the Steel Corporation, and also with the management of that corporation itself. Three partners of the firm were on the directorate of the corporation, one of whom was also chairman of the finance committee. Moreover, several other leading interests in the underwriting syndicate were the heads of some of the companies acquired and members of the first board of directors of the corporation. In other words, as managers of the Steel Corporation these various interests virtually determined the compensation for their services as underwriters.

X. Edward T. Stotesbury was a director in the Pennsylvania Steel Co. and in the Cambria Steel Co., and also a partner in the firm of J. P. Morgan & Co., and Mr. J. P. Morgan and Charles Steele and J. P. Morgan, jr., are directors in the United States Steel Corporation.

XI. Henry Walters and Samuel Mather (5–222), both directors in the United States Steel Corporation, were also directors in the Lackawanna Steel Co.

XII. Percival Roberts, jr., Henry C. Frick, George F. Baker, Norman B. Ream, and Clement Griscom were directors of the United States Steel Corporation and also directors in the Pennsylvania Railroad, which latter company has a controlling interest in the Pennsylvania Steel Co. and the Cambria Steel Co. (6–331).

OFFICERS AND DIRECTORS OF THE UNITED STATES STEEL CORPORATION.

Chairman of board and chairman of finance committee, E. H. Gary.
President, W. E. Corey.
First vice president, W. B. Dickson.
Second vice president, David G. Kerr.
Secretary and treasurer, Richard Trimble.
General counsel, Francis Lynde Stetson.
Assistant secretary, Thomas Murray.
Assistant treasurer, H. G. Hay.
Comptroller, W. J. Filbert.
Assistant comptroller, Joseph H. Craig.

DIRECTORS.

	Term Expires.		Term Expires.
Baker, George F	1911	Perkins, George W	1910
Clifford, Alfred	1910	Phipps, Henry	1910
Converse, E. C	1910	Ream, Norman B	1912
Corey, W. E	1911	Reed, James H	1912
Frick, Henry C	1912	Reid, Daniel G	1911
Gary, Elbert H	1910	Roberts, Persival, jr	1912
Griscom, Clement A	1911	Rockefeller, John D., jr	1912
Mather, Samuel	1911	Steele, Charles	1912
Moore, William H	1912	Thayer, Nathaniel	1911
Morgan, J. P	1910	Walters, Henry	1911
Morgan, J. P., jr	1910	Widener, P. A. B	1912
Morrison, Thomas	1910	Winsor, Robert	1912

The following of said officers and directors are also directors of the following companies:

Baker, George F.
- Adams Express Co., the, member of board managers.
- American Telephone & Telegraph Co., director.
- Astor Trust Co., director.
- Atlas Portland Cement Co., the, director.
- Bankers' Safe Deposit Co., vice president and trustee.
- Bowery Savings Bank, the, trustee.
- Car Trust Investment Co. (Ltd.), London, director.

Baker, George F.—Continued.
Central Railroad Co. of New Jersey, the, director.
Chase National Bank, the, director.
Chicago, Burlington & Quincy Railroad Co., director.
Cincinnati, Hamilton & Dayton Railway Co., director.
Colorado & Southern Railway Co., director.
Consolidated Gas Co. of New York, trustee.
Continental Insurance Co., the, director.
Delaware, Lackawanna & Western Railroad Co., member of board of managers.
East Jersey Water Co., director.
Erie Railroad Co., director.
Farmers' Loan & Trust Co., the, director.
First National Bank of Chicago, director.
First National Bank of New York, chairman of the board of directors.
First Security Co. of the City of New York, president and director.
Guaranty Trust Co. of New York, director.
Industrial Trust Co., Providence, director.
International Harvester Co., director.
Jersey City Water Supply Co., vice president and director.
Lake Erie & Western Railroad Co., the, director.
Lake Shore & Michigan Southern Railway Co., the, director.
Lehigh & Wilkesbarre Coal Co., director.
Lehigh Valley Coal Co., director.
Lehigh Valley Railroad Co., director.
Liberty National Bank, the, director.
Manhattan Trust Co., director.
Metropolitan Opera & Real Estate Co., president and director.
Michigan Central Railroad Co., the, director.
Mohawk & Malone Railway Co., director.
Montclair Water Co., the, director.
Morton Trust Co., director.
Mutual Life Insurance Co., of New York, the, trustee.
National Bank of Commerce in New York, director.
New Jersey General Security Co., president and director.
New York & Harlem Railroad, director.
New York & Long Branch Railroad Co., president and director.
New York & Putnam Railroad Co., director.
New York Central & Hudson River Railroad Co., director.
New York, Chicago & St. Louis Railroad Co., director.
New York Clearing House Building Co., director.
New York Mutual Gas Light Co., the, director.
Newport Trust Co., director.
Northern Pacific Railway Co., director.
Northern Securities Co., second vice president and director.
Pennsylvania Coal Co., director.
Pere Marquette Railroad Co., director.
Provident Loan Society of New York, the, trustee.
Pullman Co., the, director.
Spring Brook Water Supply Co., director.
United States Steel Corporation, director.
West Shore Railroad Co., director.

Converse, Edmund C.
Allis-Chalmers Co., director.
American Bank Note Co., director.
American Can Co., director.
Astor Trust Co., president and director.
Bankers' Trust Co., president and director.
Coronet Phosphate Co., president and director.
Fidelity Fire Insurance Co., director.
Fourth Street National Bank, Philadelphia, director.
Hudson & Manhattan Railroad Co., director.
International Nickel Co., director.
International Smelting & Refining Co., director.
Inter-Ocean Steel Co., director.
Interstate Investing Co., director.
Kewanee Oil & Gas Co., director.
Liberty National Bank, the, director.
Manning, Maxwell & Moore (Inc.), director.
McKeesport Connecting Railroad, director.
Mohican Oil & Gas Co., vice president.
National Supply Co., Toledo, director.
National Tube Co., director.
National Tube Works Co., director.
Phoenix Insurance Co., of Brooklyn, director.
Sheffield Coal & Iron Co., director.
Texas & Pacific Coal Co., director.
Union Trust Co., Pittsburgh, director.
United Bank Note Corporation, president and director.
United States Steel Corporation, director.
West Pennsylvania Railways, chairman of the board of directors.
Westinghouse Electric & Manufacturing Co., director.

Corey, William E.
American Mining Co., director.
American Sheet & Tin Plate Co., director.
American Steel & Wire Co., of New Jersey, director.
Birmingham Southern Railway Co., director.
Carnegie, Phipps & Co. (Ltd.), director.
Carnegie Steel Co., director.
Carnegie Steel Co. (Ltd.), the, director.
Carnegie Steel Co., of Pennsylvania, director.
Clairton Steel Co., director.
Chicago, Lake Shore & Eastern Railway Co., director.
Connellsville & Monongahela Railway Co., director.
Duluth & Iron Range Railroad Co., director.
Edgar Zinc Co., director.
Elgin, Joliet & Eastern Railway Co., director.
Federal Steel Co., director.
Gary Land Co., director.
H. C. Frick Coke Co., director.
Illinois Steel Co., director.
Minnesota Steel Co., director.
Minnesota Iron Co., director.
Mount Pleasant Water Co., director.
National Tube Co., director.
National Tube Works Co., director.

Corey, William E.—Continued.
Pittsburg Steamship Co., director.
Sharon Tin plate Co., director.
Shelby Steel Tube Co., director.
Tennessee Coal, Iron & Railroad Co., director.
Trotter Water Co., director.
Troy Steel Products Export Co., director.
Union Steel Co., director.
United States Coal & Coke Co., director.
United States Steel Products Export Co., director.
Youghiogheny Northern Railway Co., director.

Frick, Henry C.
Chicago & Northwestern Railway Co., director.
City Deposit Bank, Pittsburgh, director.
Mellon National Bank, Pittsburgh, director.
National Union Fire Insurance Co., Pittsburgh, director.
Pennsylvania Railroad Co., the, director.
Philadelphia & Reading Coal & Iron Co., director.
Philadelphia & Reading Railway Co., director.
Reading Co., director.
Union Insurance Co., Pittsburgh, director.
Union Pacific Railroad Co., director.
Union Trust Co. of Pittsburg, the, director.
United States Steel Corporation, director.

Gary, Elbert H.
Allis-Chalmers Co., chairman of the board of directors and member of finance committee.
American Bridge Co., director.
American Bridge Co. of New York, director.
American Sheet & Tin Plate Co., director.
American Steel & Wire Co. of New Jersey, director.
American Steel Foundries, director.
American Trust & Savings Bank, Chicago, director.
Bessemer & Lake Erie Railroad Co., director.
Bullock Electric Manufacturing Co., director.
Carnegie Steel Co., director.
Chicago, Lake Shore & Eastern Railway Co., director.
Commercial National Bank of Chicago, director.
Duluth & Iron Range Railroad Co., director.
Duluth, Missabe & Northern Railway Co., director.
Elgin, Joliet & Eastern Railway Co., director.
Empire Bridge Co., director.
Federal Steel Co., president and director.
Gary-Wheaton Bank, Wheaton, Ill., president and director.
H. C. Frick Coke Co., director.
Hudson & Manhattan Railroad Co., director.
Illinois Steel Co., director.
International Harvester Co., director.
Lake Superior Consolidated Iron Mines, director.
Merchants Loan & Trust Co., Chicago, director.
Minnesota Iron Co., director.
Minnesota Steel Co., director.
National Tube Co., director.
Newburg & South Shore Railway Co., director.

Gary, Elbert H.—Continued.
New York Trust Co., member of executive committee and director.
Oliver Iron Mining Co., director.
Phoenix National Bank of the City of New York, The, director.
Pittsburgh, Bessemer & Lake Erie Railroad Co., director.
Pittsburgh Steamship Co., director.
Southern Railway Co., director.
Tennessee Coal, Iron & Railroad Co., director.
Union Steel Co., director.
United States Coal & Coke Co., director.
United States Natural Gas Co., director.
United States Steel Products Export Co., director.
Universal Portland Cement Co., director.
Griscom, Clement A., jr., president and director of the Griscom-Spencer Co.
American Finance & Securities Co., The, director.
Bell Pure Air & Cooling Co., president and director.
Development Co. of America, The, director.
El Tiro Copper Co., director.
Empire Trust Co., director.
Guanajuato Reduction & Mines Co., The, vice president and director.
New York Real Estate Security Co., director.
Reilly Heater & Evaporator Co., director.
Moore, William H.
American Can Co., director.
Chicago & Eastern Illinois Railroad Co., director.
Chicago, Rock Island & Pacific Railroad Co., director.
Chicago, Rock Island & Pacific Railway Co., director.
Delaware, Lackawanna & Western Railway Co., director.
Evansville & Indianapolis Railroad, director.
Evansville & Terre Haute Railroad Co., director.
Evansville Belt Railway Co., director.
Fidelity Fire Insurance Co., director.
First National Bank of New York, director.
First Security Co. of the City of New York, director.
Kansas City, Fort Scott & Memphis Railway Co., The, director.
Kansas City, Memphis & Birmingham Railroad Co., director.
Keokuk & Des Moines Railway Co., director.
National Biscuit Co., director.
Peoria & Bureau Valley Railroad Co., director.
Price Flavoring Extract Co., director.
Rock Island Co., The, director.
St. Louis & San Francisco Railroad Co., director.
United States Steel Corporation, director.
Morgan, J. Pierpont.
Ætna Insurance Co., Hartford, Conn., director.
Carthage & Adirondack Railway Co., director.
Carthage, Watertown & Sackets Harbor Railroad Co., director.
Central New England Railway Co., director.
Cleveland, Cincinnati, Chicago & St. Louis Railway Co., director.
Columbus, Hope & Greensburg Railroad, director.
Dunkirk, Allegheny Valley & Pittsburgh Railroad Co., director.
Ellenville & Kingston Railroad Co., director.
First National Bank of New York, director.
First Security Co. of the City of New York, director.

Morgan, J. Pierpont—Continued.
Fort Wayne, Cincinnati & Louisville Railroad Co., director.
Fulton Chain Railway Co., director.
Fulton Navigation Co., director.
General Electric Co., director.
Harlem River & Port Chester Railroad, director.
Hartford & Connecticut Western Railroad Co., director.
Jersey City & Bayonne Railroad Co., director.
Lake Erie & Western Railroad Co., director.
Lake Shore & Michigan Southern Railway Co., The, director.
Mexican Telegraph Co., director.
Michigan Central Railroad Co., The, director.
Mohawk & Malone Railroad Co., director.
National Bank of Commerce in New York, director.
New England Navigation Co., director.
New England Railroad Co., director.
New Jersey Junction Railroad Co., director.
New Jersey Shore Line Railroad Co., director.
Newport Trust Co., director.
New York & Harlem Railroad Co., director.
New York & Northern Railway Co., director.
New York & Ottawa Railway Co., director.
New York & Putnam Railroad Co., director.
New York Central & Hudson River Railroad Co., The, director.
New York, Chicago & St. Louis Railroad Co., director.
New York, New Haven & Hartford Railroad Co., director.
New York, Ontario & Western Railway Co., director.
New York State Realty & Terminal Co., director.
Niagara Falls Branch Railroad Co., director.
Ontario, Carbondale & Scranton Railway Co., director.
Pittsburgh & Lake Erie Railroad Co., director.
Port Jervis, Monticello & Summitville Railroad Co., director.
Poughkeepsie Bridge Railroad Co., director.
Pullman Co., The, director.
Raquette Lake Railway Co., director.
Rhode Island Co. (electric line), director.
Rutland Railroad Co., director.
St. Lawrence & Adirondack Railway Co., director.
Syracuse, Geneva & Corning Railway Co., director.
Terminal Railway of Buffalo, director.
United States Steel Corporation, director.
Wallkill Valley Railroad Co., director.
West Shore Railroad Co., director.
Western Union Telegraph Co., director.

Morgan, J. Pierpont, Jr.
Acadia Coal Co., Limited, director.
International Mercantile Marine Co., The, director.
Northern Pacific Railway Co., director.

Murray, Thomas.
American Bridge Co., director.
American Bridge Co., of New York, director.
American Sheet & Tin Plate Co., director.
American Steel & Wire Co., of New Jersey, The, director.
Duluth & Iron Range Railroad Co., assistant secretary, assistant treasurer, and director.

Murray, Thomas—Continued.
Federal Steel Co., first vice president and director.
Lake Superior Consolidated Iron Mines, vice president and director.
National Tube Co., director.
Scott & Fowles Co., director.
Tennessee Coal, Iron & Railroad Co., director.
Traction Equipment Co., director.
United States Steel Products Export Co., secretary and director.
Perkins, George W.
Astor Trust Co., director.
Bankers' Trust Co., director.
Cincinnati, Hamilton & Dayton Railroad Co., chairman of the board of directors.
Dayton & Union Railroad Co., director.
German-American Insurance Co., director.
Great Central Dock Co., vice president and director.
Hamilton Belt Railway Co., vice president and director.
International Harvester Co., chairman of finance committee and director.
International Mercantile Marine Co., director.
Marquette & Bessemer Dock & Navigation Co., director.
National City Bank of New York, The, director.
New York Trust Co., trustee.
Northern Pacific Railway Co., director.
Northern Securities Co., director.
Pere Marquette Railroad Co., chairman of the board of directors.
United States Steel Corporation, director.
Phipps, Henry.
Mellon National Bank, Pittsburgh, director.
Philadelphia Rapid Transit Co., director.
United States Steel Corporation, director.
Ream, Norman B.
Baltimore and Ohio Railroad Co., director.
Brooklyn Heights Railroad Co., director.
Brooklyn Rapid Transit Co., director.
Central Safety Deposit Co., vice president and director.
Chicago & Erie Railroad Co., director.
Chicago, Burlington & Quincy Railroad Co., director.
Cincinnati, Hamilton & Dayton Railroad Co., director.
Cumberland Corporation, director.
Erie Railroad Co., director.
First National Bank of Chicago, director.
Franco-American Financial Association, The, director.
International Harvester Co., director.
Metropolitan Trust Co. of the City of New York, director.
National Biscuit Co., director.
New York, Susquehanna & Western Railroad Co., director.
New York Trust Co., trustee.
Pennsylvania Coal Co., director.
Pere Marquette Railroad Co., director.
Pullman Co., The, director.
Reliance Co., The, director.
Seaboard Air Line Railway, director.
Securities Co., The, director.
United States Steel Corporation, director.

Reid, Daniel G., vice president and director of the Liberty National Bank.
American Can Co., director.
Astor Trust Co., director.
Bankers' Trust Co., director.
Chicago & Eastern Illinois Railroad Co., director.
Chicago, Rock Island & Pacific Railroad Co., director.
Chicago, Rock Island & Pacific Railway Co., the, chairman of the board of directors.
Continental Insurance Co., The, director.
Evansville & Indianapolis Railway, vice president and director.
Evansville & Terre Haute Railroad Co., vice president and director.
Guaranty Trust Co. of New York, director.
Keokuk & Des Moines Railroad Co., vice president and director.
Peoria & Bureau Valley Railroad Co., president and director.
Rock Island Co., The, director.
St. Louis & San Francisco Railroad Co., director.
Second National Bank, Richmond, Ind., director and vice president.
Union National Bank, Richmond, Ind., director.
United States Steel Corporation, director.

Rockefeller, John D., jr.
American Linseed Co., director.
Delaware, Lackawanna & Western Railroad Co., member of board of managers.
Standard Oil Co. (of New Jersey), director.
United States Steel Corporation, director.

Steele, Charles.
Adams Express Co., The, member of the board of managers.
Alabama Great Southern Railroad Co., director.
Atchison, Topeka & Santa Fe Railway Co., The, director.
Central Railroad Co. of New Jersey, The, director.
Chicago & Erie Railroad Co., director.
Chicago, Indianapolis & Louisville Railway Co., director.
Cincinnati, Hamilton & Dayton Railway Co., director.
Erie & Jersey Railroad Co., director.
Erie Railroad Co., director.
General Electric Co., director.
Gulf, Colorado & Santa Fe Railway Co., director.
International Harvester Co., director.
International Mercantile Marine Co., The, director.
Lehigh Valley Railroad Co., director.
Lehigh Valley Railway Co., director.
National Tube Co., director.
New Jersey & New York Railroad Co., director.
New York, Susequehanna & Western Railroad Co., director.
Northern Pacific Railway Co., director.
Pere Marquette Railroad Co., director.
Santa Fe, Prescott & Phoenix Railway Co., director.
Southern Railway Co., director.
Standard Trust Co., director.
United States Steel Corporation, director.

Stetson, Francis Lynde.
Atlantic Coast Lumber Corporation, director.
Cataract Power & Conduit Co., of Buffalo, director.
Chicago & Erie Railroad Co., director.

on, Francis Lynde—Continued.
Erie & Jersey Railroad Co., director.
Genesee River Railroad Co., director.
New York, Susquehanna & Western Railroad Co., director.
Niagara Falls Power Co., The, director.
Niagara Development Co., director.
Niagara Junction Railway, director.
United States Express Co., director.
United States Rubber Co., director.
ble, Richard.
Elgin, Joliet & Eastern Railway Co., director.
Federal Steel Co., secretary, treasurer, and director.
Lake Superior Consolidated Iron Mines, director.
Minnesota Steel Co., treasurer and director.
National Tube Co., director.
Tennessee Coal, Iron & Railroad Co., director.
Union Steel Co., director.
ers, Henry.
Atlanta & West Point Railroad Co., director.
Atlantic Coast Line Co., The, chairman of the board of directors.
Atlantic Coast Line Railroad Co., chairman of the board of directors.
Belt Line Railway Co. (Montgomery, Ala.), director.
Charleston & Western Carolina Railway Co., vice president and director.
Chesapeake Steamship Co., director.
Chicago, Indianapolis & Louisville Railway Co., director.
Columbia, Newberry & Laurens Railroad Co., director.
Cuba Co., The, director.
Lackawanna Steel Co., director.
Louisville & Nashville Railroad Co., chairman of board of directors.
Milledgeville Railway Co., director.
Nashville, Chattanooga & St. Louis Railway Co., director.
New York Shipbuilding Co., director.
Northern Central Railway Co., director.
Northwestern Railroad Co. of South Carolina, director.
Old Dominion Steamship Co., director.
Richmond-Washington Co., director.
Safe Deposit & Trust Co., Baltimore, vice president and director.
Southern Cotton Oil Co., The, director.
Virginia-Carolina Chemical Co., director.
Washington Southern Railway Co., director.
Western Railway of Alabama, director.
Western Union Telegraph Co., The, director.
Wilmington Savings & Trust Co. (Wilmington, N. C.), vice president and director.
son, William B.
Butte Coalition Mining Co., director.
Carnegie Steel Co., director.
Minnesota Steel Co., president and director.
Montclair Trust Co., director.
National Tube Co., director.
Red Metal Mining Co., director.
Tennessee Coal, Iron & Railroad Co., director.
Trenton Iron Co., director.
Union Steel Co., president and director.

Filbert, William J.
Essex Iron Co., director.
Lake Superior Consolidated Iron Mines, director.
Minnesota Steel Co., secretary and director.
Tennessee Coal, Iron & Railroad Co., director.
Troy Steel Products Co., director.
Union Steel Co., director and secretary.

In the summary of the evidence submitted as Exhibit 29 of this report, under the heading of "United States Steel Corporation—Financial and corporate operations, year by year," there are presented a number of references to the purchase of stocks of other companies, the bonds of other companies, and the property and plants of other companies, together with various transactions with outside companies commonly regarded as having no connection with the United States Steel Corporation. Reference is made to that data. Reference should also be made to the schedule or statement requested to be furnished by the United States Steel Corporation, and which is referred to in paragraph 8 of this report.

10. The policy of the Steel Corporation resulting in enhancing the prices of raw and semifinished material. As we have seen above, in regard to pig iron, the Steel Corporation officers declared the policy of buying all the available supply in order to keep the price up. Also, in regard to raw and semifinished products, a policy is pursued having a similar effect upon competing concerns. The result of the practices now considered is, of course, markedly intensified by the policy of reducing output to conform to the estimated demand or the proportion of that demand conceded to different mills, which is referred to hereunder in connection with the Gary dinners.

In the minutes of the Carnegie Steel Co.'s directors the vice president and general sales manager stated:

The average price of pig iron for November was $22.81, covering sales of about 36,000 tons, which is enough to make a market. This will have the effect of advancing the price on our raw-material contracts over the third-quarter price nearly $3 per ton. It will make the majority of our billet contracts, Crucible, for instance, pretty nearly $29 per ton, and Oliver will pay $30. When you consider that the price of finished material to-day is only $3 to $4 per ton above this figure, and considerable finished material is sold on old contracts at a much lower price than that of to-day, how these people can pay this price for their raw material is a pretty hard problem. (Dec. 3, 1906.)

In April 5, 1904, in the finance committee of the Steel Corporation (Mr. Perkins in the chair), it was recommended that subsidiary companies who are manufacturing semifinished products do not sell same to outsiders in competition with subsidiary companies who are manufacturing finished product from such semifinished products, without the consent of the subsidiary company interested.

In March 21, 1906, and April 18, 1906, in the minutes of the general managers of sales of the Steel Corporation, it is stated that "refer-

ring to the change of policy decided on by the corporation that we are not in the future to sell any raw material other than that which we can not use in our own finishing mills," the Carnegie Steel Co. intend to cancel all their contracts for such material.

In July 16, 1906, it appears in the minutes of the directors of the Carnegie Steel Co. that—

We have served notice on a lot of contracts expiring January 1st that we will not renew them. As a matter of fact we need hardly sell a pound of raw material now to outsiders. At Duquesne, for instance, the new lined mill is now taking 65 tons of steel per day, and before long we will be taking 100 tons per day, and as every bit of this is taken from the trade the situation is growing worse all the time.

As early as July 1, 1902, in the minutes of the Carnegie Steel Co. directors, it was recognized that the decision that "at the last meeting of the presidents it was decided by a majority and approved by the president of the Steel Corporation that Carnegie and National Steel companies are not to sell unfinished material on scale contracts to any companies competing with constituent companies of the corporation," "will mean more shutdowns in the future than in the past"; but the truth of this statement as a prediction is best verified by the result.

On March 20, 1907, in the minutes of the general managers of sales of the United States Steel Corporation, it appears:

Raw material. Reporting on the raw-material situation, Mr. Bope stated it is worse to-day than he has ever seen it before, and he did not know where it is going to end. A number of their customers are practically shut down now for want of steel, and some of them have gone into the market trying to buy tonnage, but have not so far been very successful.

On April 17, 1907 (id.), it appears—

Raw-material situation. The chairman advised this situation is no better, and, if anything, worse.

On June 24, 1907, in the minutes of the directors of the Carnegie Steel Co., it appears—

There are some things in the situation which are going to have an effect upon the raw end. Milliken Bros. have gone into the hands of a receiver and shut down their rolling mills. For the present, at least, it is the intention to operate only their structural plant, and they are now in the market to buy the tonnage required to fill their contracts, amounting to 45,000 tons to be placed and taken out within the next six or eight months, besides any additional steel they will need on new contracts the receivers may make. This is tonnage which they had figured upon making themselves, but which will now come into the market. It may not come to us, but in any event it means that much capacity shut down.

The Basic Steel Co. have also shut down their rolling mill, possibly for good, and will operate only their structural plant. One or two of the eastern concerns are reported as being a little shaky.

This is all due to the fact that the raw material has gone so high that the people who have to buy heavily are simply down and out; there has not been

maintained a relative difference between raw and finished products to enable them to continue operations at a profit. It is not a condition that anybody is responsible for, simply due to the fact that supply and demand have been such that finished prices could not go up, and raw material being so scarce, prices were raised on it.

Also idem, July 1, 1907:

The Eastern Steel Co., it is reported, is not in very good shape financially, and it is possible they will also shut down. This will eliminate all of our new competition outside of Bethlehem and will make our proposition, on the whole, difficult.

Also idem, February 8, 1909, it was stated that the—

mills which are in this business (forgings) are holding up the price of billets and pulling down the price of finished forgings, which is practically putting the independent forge makers out of the market. And on shafting, Jones & Laughlin are selling at a price which their competitors can not afford to meet after paying the market price of 1.40 cents for bars.

On July 16, 1906, as appears above, the Carnegie Steel Co. served notice of refusal to renew contracts, and on November 5, 1906, it appears—

The tube company will be getting the benefit of their higher prices this month, and, commencing December 1, they will be paying us at least $2 and possibly $3 to $4 more per ton for their skelp than at present. I have already arranged this.

Tubes, of course, are a highly finished product.

In this connection it should be noted that special terms are granted to the American Bridge Co., which sells finished product (general manager of sales' minutes, United States Steel Corporation, July 17, 1901), and a concession is made to the finishing company when it sells for export at less than a fair profit (Id., May 22, 1901); see also in this connection the contract to make payments to the American Bridge Co. of New York made by the American Bridge Co. of New Jersey. (Dir. min., Oct. 17, 1901.)

11. The percentage of ore owned and controlled by the United States Steel Corporation must be viewed, as to its effect, in the light of the conduct and policy disclosed above. The passive ownership of large reserves would be of no effect upon the steel business, except, of course, the effect of removing from use part of the available supply. But the ownership of 76 per cent of the competitive ore in Minnesota and 500,000,000 tons in the South, or, in all, 2,500,000,000 tons out of 4,462,940,000 tons of commercially available ore in the United States (Report Com. Corp., pp. 378-382), in one ownership (as against fragmentary segments of the remaining minor part held by all the rest of the holders), which is held by owners engaged in a line of business in which new competition is inherently and unusually difficult (Tariff Hearings, 1908, vol. 2, pp. 1850–1852) because of the immense initial

outlay required [estimated at fifty to a hundred million dollars (6–339), and the difficulty of getting a steady supply of ore (18–1291)], which owners do not sell ore (3–85); who enhance the price of pig iron by purchasing all the known available supply; who do not sell pig iron except at arbitrary, increased prices; who do not sell raw materials or semifinished materials; who control 90 per cent of the export sales largely at prices below domestic prices; who through combination maintain an average standing cash balance of $75,000,000 (3–132; 20–1425); who have so much lower cost of production that it is admitted that the so-called independents can not compete with them in free competition (Tariff Hearings, 1908, vol. 2, pp. 1751, 1750, 1728, 1729; and in hearings of this committee, vol. 4, p. 195; vol. 3, p. 83), who have power to recoup the diminished profits or expenses of one branch from another branch of their articulated organization, and which owners, while operating in this manner, keep down the prices of finished products, such as rails (3–92; 3–97 Tariff Hearings, vol. 2, pp. 1650–1651, 1676, 1677), is an ownership and a control which must interfere with competition.

12. Hereunder follows a number of extracts from testimony, evidence, and other sources bearing upon the Gary dinners and matters connected with them, and an explanatory statement of their bearing upon the inquiry which was prepared by Mr. Anthony J. Ernest, a member of the New York bar, who extracted the said minutes and collected the evidence relating to this matter.

I had Mr. Ernest prepare the matter relating to these subjects, inasmuch as my authorization and instructions from the committee embraced a wider inquiry than merely examining the accounts, and included an examination of the Sherman law, the resolution appointing the committee, the testimony, and other data.

A number of agreements allotting certain percentages of the business and fixing prices existed between subsidiary companies and so-called independent companies at the time of the organization of the United States Steel Corporation, which were continued until 1904, and other agreements were entered into in July, 1908, and continued until 1909. (Answer of United States Steel Corporation, p. 41.) It was also testified that although the operation of some of the agreements was terminated in 1904, that the meetings were continued, and information was exchanged until 1908. It is now claimed that all of these agreements are discontinued, and the only relation that the United States Steel Corporation has with such independent companies is that which may exist because of the Gary dinners. The first Gary dinner was held in November, 1907. It is admitted that the price of at least one commodity, i. e., standard rails, has remained fixed, notwithstanding the termination of the pool agreements; and the prices of other commodities—to an extent to be

determined hereafter—have been influenced by the interchanges at the Gary dinners.

The effect of the transition from the system of written contracts with penalties or secret meetings for interchange of data as to the output and prices, to the system of Gary dinners, should be considered.

First. Several of the pooling agreements were rendered unnecessary by the concentration of control of the several subsidiary companies in the United States Steel Corporation. For example, it was no longer necessary for the American Steel Hoop Co. to pay the Illinois Steel Co. $150,000 a year to stay out of the cotton-tie business (minutes directors Carnegie Steel Co., July 30, 1901), nor was it necessary for the Carnegie Co. to agree to keep out of the bridge business unless the American Bridge Co. failed to make two-thirds of the bridge work in the United States (minutes directors Carnegie Co., Apr. 23, 1900; minutes directors American Bridge Co. of New Jersey, May 10, 1900), any more than it was necessary to pay $5,000 a month to the New Jersey Steel & Iron Co. not to operate certain of its structural plants as provided in the Structural Steel Association agreement (24–1718, 1813), because as the holding company controlled all the companies just named.

William Temple, the commissioner of the Steel Plate and the Structural Steel Associations, testified that Mr. Gary had terminated the pools because "he did not believe associations of this character were desirable or longer necessary" (24–1717–1718).

The policy of discontinuing such methods of controlling otherwise apparently independent concerns was followed in other cases. For example, the Carnegie Steel Co. in June, 1909, as appears by the minutes of directors of that company, recommended the sale of 675 shares of the stock of 18 small ginning companies which had been bought for $19,050, and which were marked down to $8,651.25, it being said: "As the purposes for which they were taken have now been accomplished, as evidenced by the fact that the shipment of cotton ties this year amount to about 2,500,000 bundles, we may as well sell them." "These are stocks of companies which favor square bales of cotton and use our cotton ties exclusively."

In relation to the Gary dinners, Mr. Gary, when asked about the statement made at one of the dinners, that—

> We come together upon a platform that involves the honor of a man, which is far better, and far higher, and far more binding upon us than any contract which we could make.

testified that it would be dishonorable conduct for a man to sell goods at a different price from that which he told others in the business he was selling at (5–266).

The statement that those at the dinner "come together upon a platform that involves the honor of a man, which is far better, and far higher, and far more binding upon us than any contract which we could make," is of practical importance in estimating the effect of the change from the system of written contracts to the system of meeting at the Gary dinners.

The previous pool agreements were not enforceable (18–1286, 1287; 6–321), and the only thing that could enforce them was the forfeit or the sense of obligation on the part of the men making them (18–1287), and the violation of the agreements did not bar anyone from entering a new pool (18–1320). Mr. Temple, the commissioner, testified that the respective mills in the pools would deliberately exceed their allotments, and even incurred a penalty, in order to obtain a larger allotment the following year (24–1712).

But it seems that the enforcement of penalties was not insisted upon. Mr. Temple said: "I am pleased to state I never assessed a penalty for any violation" (24–1716); and Mr. Schwab also said there was a small money forfeit in the plate agreement, and that he did not recall any other agreements that had that forfeit, and he testified (18–1320):

Mr. BARTLETT. Did he not pay into a common treasury fund, and in case he violated the agreement was not part of that to be taken and charged up to him?

Mr. SCHWAB. No; I do not know of any instance of that kind excepting the one we speak of—the plate. They were generally agreements or understandings such as I have spoken of, where each one was entitled to a certain percentage of the business, and we maintained the price. Those were the only two things that we really needed any agreement on.

Mr. BARTLETT. And it depended altogether upon the gentleman as to whether he kept it or not?

Mr. SCHWAB. Quite so.

Mr. BARTLETT. He could not make another after he violated the first?

Mr. SCHWAB. Oh, I would not say that. We did. We were rather forgiving in those things.

And even the money paid in was returned to those members of the pool who paid it in after the first one or two years, as Mr. Temple testifies, as follows (24–1721):

This distribution of the moneys in the association at the end of the year was not continued beyond the first one or two years of the association. The first year they were rigidly distributed. Every man demanded his pound of flesh. The second year—I think it was the second year—by almost unanimous consent, they decided that owing to certain conditions they would not distribute the money that year, but would return it to the members of the association who had paid it in.

And at 24–1717 he testifies:

After a very few meetings they commenced to get acquainted with each other, found they were all human, and the suspicion, intense suspicion, amounting to almost certainty of intended fraud, ceased to be so apparent. So that at the

end of the first year they were all good friends. Then they began exchanging actual information with each other. There was scarcely any question that one maker would ask another that he would not answer, even about the most intimate secrets of his business, his costs, and things of that sort. It made the steel business, so far as the people associated with those associations were concerned, rather a family affair than one of destructive warfare.

Mr. Temple states they worked just as harmoniously after dissolution of the pool agreements as they did before and that the former members did not exceed their proportionate tonnage even after the dissolution of the pools if it unsettled prices, and they would explain any excess of their share of the business (24–1734, 1735, 1718, 1719, 1746). Mr. Huston said that there is no agreement in existence "only as a man. If I should say to some one that my price was going to be so and so I would expect to hold it" (11–681, 682, 686).

The testimony of several witnesses indicates that a considerable degree of fraternal relations arose amongst the steel manufacturers through the pools and meetings and interchange of information.

And the Commissioner of Corporations discusses the working of gentlemen's agreements and pools as follows (p. 75):

Gentlemen's agreements * * * The gentlemen's agreement proper was distinguished from the pool in that no formal organization for regulating output or prices existed, the efficacy of the agreement simply depending upon the faithfulness of the members in maintaining informal pledges. Such gentlemen's agreements contained no provisions for forfeits in case of infraction, or for the acquisition or subsidizing of outside plants to prevent competition.

The report then continues, under the heading—

SEC. 5. Weakness of pool agreements a contributory cause of the organization of corporate consolidations—

to review the failure and disruption of various pools, and concludes:

These experiments at combination, however, undoubtedly tended to hasten the progress of the consolidation movement proper. The success, even though brief, of some of these pool organizations in securing large profits for their members had illustrated the advantages of concerted action. At the same time the low prices which followed the disruption of these associations, coming as they did after several years of acute depression in the industry, had a very discouraging effect, and manufacturers were ready to listen to almost any plans which promised increased profits.

Mr. Gayley testified that he did not have any knowledge of the existence of the pooling agreement in 1901, and when asked by Mr. Young, "Was that change, in your judgment, caused by the organization of the Steel Co?" he answered, "It may have been the natural result of it" (7–371); and Mr. Schwab testified before the Ways and Means Committee, December 15, 1908, at the tariff hearings, that he would not vary the $28 price of rail 10 cents a ton, because it would precipitate a steel war "that would result in running my works without any profit. I would not vary the price of rails under any cir-

cumstances, not if I knew I was to get 100,000 tons of orders, for the reason that my competitor next door would put the price down one dollar or half a dollar a ton, even, and we would be in a position where we would be running without any profit at all"; and Mr. Schwab testified that the same is true of all steel products, such as structural, plates, etc. (Tariff Hearings, vol. 2, pp. 1650–1651, 1676, 1677.)

Mr. Temple when asked, "Could they maintain, by the gentlemen's agreement, that level of price and prevent that destructive competition of which you spoke in the Carnegie régime?" answered, "They say the leopard can not change his spots, nor the Ethiopian his skin; but the leopard does move from place to place, which, in one figure of speech, is a change of spots. I would not presume to say how closely they could follow the rules they have learned, under the bitter warfare preceding 1897, and the different conditions from 1897 to 1907, but I have not heard of any destructive competition since that time. Further than that I have no knowledge on the subject." (24–1719.)

The general trend of the conventions between the steel manufacturers during the period after the termination of the enforcement of penalties was for the maintenance of prices and the limitation of production according to their estimate of the existing demand.

These same practices are advocated and commended by the speakers at the Gary dinners. The purpose and intent to maintain prices was declared many times. (See Gary, vol. 3, pp. 76, 78; vol. 4, pp. 195, 196; vol. 5, pp. 266, 268, 269. See also short extracts from the remarks of all speakers at the Gary dinners bearing upon the subject in the summary and index of the evidence, under the heading of "Gary Dinners," pp. 42–55.)

The purpose and intent to keep down production and output was declared many times. (See Gary, vol. 5, p. 265; Willis L. King, vol. 5, p. 269; Gary, vol. 5, pp. 270, 272–274, 275. See also short extracts from the remarks of all speakers at the Gary dinners bearing upon the subject in the summary and index of the evidence, under the heading of "Gary Dinners," pp. 42–55.)

The purpose and intent to refrain from changing prices after declaring in favor of a named price, except upon so stating to the other participants, is advocated many times. (See Gary and Huston, vol. 5, p. 277; Kelly and Gary, vol. 5, p. 279; Gary, vol. 5, p. 281. See also short extracts from the remarks of all speakers at the Gary dinners bearing upon the subject in the summary and index of the evidence, under the heading of "Gary Dinners," pp. 42–55.)

The policy of maintaining prices and keeping down production to conform to an estimate of the existing demand has been questioned by Mr. Carnegie (see Tariff Hearings, 1908, vol. 2, p. 1803, and vol. 4, p. 197, before this committee) and by others in the steel business who had been in favor of open competition, such as Mr. Gates (see vol. 1, p. 43) and Mr. Schwab (18–1279).

The Gary dinner arrangement, in which independents are influenced to reduce their production conformably to their estimate of the reduction in the demand existing, and to maintain prices, restricts the action of the participants as far as they reduce their production and maintain prices. The arrangement is designed and intended to operate, and has operated admittedly, as to standard and steel rails, although it is claimed that independents may cut prices without fear of penalty, except the dishonor of declaring in favor of a named price and then selling at some other price. As is stated in the answer of the United States Steel Corporation, the chairman of the board of directors of the said corporation at his opening address at the meeting of January 11, 1911, declared his position as follows:

> I would not make an agreement under any circumstances to maintain prices or to do or to refrain from doing anything which would prevent me from being absolutely independent from all others in every respect concerning every department of our corporation, or in regard to the conduct of our business, and I would not ask for any different conclusion from others. As I said before, the very fact that it is understood we have this right, that we are independent, that we can go out of this room and do exactly as we please without violating any agreement or understanding, and that all must depend upon the belief that as honorable men we are desirous of conducting ourselves and our business in such a way as not to injure our neighbors, must make each of us more careful in regard to the conduct of our affairs, and there will be no secrecy in what we do.

But the fact that the independents may cut prices, in spite of their cooperation in the Gary dinner arrangement, does not affect the results admittedly accomplished, namely, they do not cut prices of standard rails. And, as Mr. Schwab testified, "there has been no manufacturer selling rails that would dare change that price," and "that is true of every line of which I spoke * * *. Structural steel and steel products." (Tariff Hearings, vol. 2, 1908, p. 1676.) The participants also indorse the policy promulgated by Mr. Gary, to the effect that it is dishonorable to sell at a different price from that announced to fellow manufacturers, and they cooperate in the practice of reducing production. (See references above.)

And it is not material that in the cooperation of the participants in the Gary dinners no penalty attaches to a violation of the declarations mutually exchanged, because no penalty for reducing prices or exceeding a fixed share of the business could be enforced. The previous pool agreements may have been broken and penalties inflicted by the members themselves, although, as we have seen, this was soon

discontinued. It will be assumed, even if a fund had not been deposited, that the men in the old pools would have paid their fines. If this be assumed, it can also be assumed that the word of the participants in the Gary dinners is ample security for the professions of cooperation subscribed to at the dinners. It seems to be recognized by the representatives of the United States Steel Corporation that the arrangement made at the Gary dinners would be an arrangement in restraint of trade if the agreements were binding. (See Gary, 5–266.) On the other hand, any contract may be broken and any arrangement may be upset by recalcitrants.

Whether it is a contract which can be broken or an understanding which can be departed from or a pledge of honor which can be violated is immaterial. What determines the character of the arrangement is not its liability to be broken, but what can be and is done under it. It seems that there has been sufficient performance of the subject of the "meeting of the minds" at the Gary dinners to prove that, as far it is carried out, it must interfere with one participant competing with another, even though disaffected or ill-advised participants might isolatedly violate their pledges. In other words, paraphrasing the language that has been used in another place under similar circumstances, although it was not the purpose of the association to prevent the members from reducing rates or changing rules and regulations fixed by the association, but that by the terms of the agreement a member might do so, the preliminary requirement being that the proposed change should be voted upon at a meeting of the association, after which if the proposal was not agreed to, the one making the proposal could make such reduced rates, notwithstanding the objections of the other ones; that the purpose of this provision was to afford opportunity for the reasonableness of any proposed law, rule, or regulation to be considered by all interested and an interchange of views on the effect of such reduction, and that reductions of rates had been made in numerous instances through the said process by the association, and there was no duress of fines or penalties or otherwise, nevertheless the conventions agreed to and enforced would be objectionable as regards their effect upon competition.

But the effect of the Gary dinners can not be considered in a manner that would be at all useful in this inquiry if there be omitted from consideration the fact or facts testified to by Mr. Gary to the effect that there are no concerns that can compete with the United States Steel Corporation in a condition of open competition.

Mr. Gary duly testified (Dec. 18, 1908) as follows:

> I do believe large numbers would be driven out of business if we were willing to drive them out either because we thought it was right to do so or good policy to do so. (Tariff Hearings, 1908, vol. 2, p. 1751.)

If, in any particular line, by reason of our opportunities, our wealth, our organization, and our ownership of the best raw products, we can manufacture cheaper than our competitors, then, with reference to that line, we could drive them out of business. (Tariff Hearings, 1908, vol. 2, p. 1750.)

Mr. CLARK. Suppose this case: Suppose you did conclude for any reason; no difference what, to mark yours up to $30, and one of these independent concerns thought it had a good opportunity to make money and it held its at $28 or marked them down to $27, have you not such a hold on the American market that you could immediately mark yours down to $20 or $25 long enough to put that fellow clear out of business and then mark yours up again to where you wanted it?

Mr. GARY. Quite likely; that may be true. I will not say that it is not true. I will not say that in the competition we could not drive a good many of our competitors out of the business.

Mr. CLARK. Now another thing.

Mr. GARY. It is not because of a hold on the market.

Mr. CLARK. What is it, then?

Mr. GARY. It is because of our ability to produce cheaper and because of our ownership in the independent concerns, such as the railroads, the steamship lines, etc., which gives a large credit from the United States Steel Corporation's standpoint. (Tariff Hearings, 1908, vol. 2, p. 1728.)

Of course, if we were in competition in self-defense—and that is the only kind of competition I believe in—speaking for myself—that is, destructive competition—if we were in destructive competition in self-defense, we would mark down to pretty nearly our cost, and the result would be that the competitor who could not manufacture as low as we could would go out of business in the course of time. (Tariff Hearings, 1908, vol. 2, p. 1729.)

In reference to the effect of taking off the tariff upon iron or steel, Mr. Gary testified: "I think many, if not most, of our competitors would soon be out of business, and we should have the field," if there were reductions in the tariff. And when asked if that would not be to the interest of the United States Steel Corporation from a selfish standpoint, Mr. Gary testified:

I think it would be the worst thing that could happen to United States Steel, because the people would not stand it.

And he testified to the same effect in volume 4, page 177, of the hearings before this committee.

Mr. Gary also testified in volume 4, page 195:

On the other hand, except for some basis whereby destructive competition could be avoided, whereby the old methods of doing business, under which, as you probably know, a few only of the steel companies were allowed to survive and do business and a large majority were wrecked, if we should enter into that kind of competition, it would mean that a large percentage at least of the manufacturers of steel would be wrecked, and that would secure to the survivors to a greater or less extent a monopoly. (Vol. 4, p. 195.)

Mr. Gary testified in December, 1908, while being examined by Mr. Cockran in reference to the power that might be exercised to obtain a monopoly by the United States Steel Corporation, as follows:

Mr. COCKRAN. * * * Now, among the conditions that contributed to that situation an important element is your ownership and control of the ore supply?

Mr. GARY. Yes; of course it is.

Mr. COCKRAN. You practically do control the ore supply of the country?

Mr. GARY. No; not now; not for the immediate future.

Mr. COCKRAN. Well, the ultimate supply?

Mr. GARY. Yes; I think so—that is, pretty nearly. It is not absolute control.

And when Mr. Gary was examined in reference to this testimony, in the hearings before this committee, he said (vol. 3, p. 83):

Mr. GARY. Now, this is what I had in mind at that time. In the first place, I did not have the figures before me as clearly as I have since. Those questions were asked me without giving me any previous notice, and therefore without opportunity to look into the figures. But at that time I believed the United States Steel Corporation had control of something like 65 or 70 per cent of the best ores in the Northwest, and I believed the ores which the others had would be exhausted before the ores in control of the United States Steel Corporation. If so, the time would come when they would be in possession of some of those ores after the others were exhausted, and then, of course, the others would be compelled to use ores which at the present time are not even merchantable, which, as I have said, are scattered all over the country.

The independents in the steel business should have no ground to doubt the complete accuracy of the statements contained in the foregoing extracts from Mr. Gary's testimony. Mr. Gary's statement that if competition existed they could reduce their prices to a point where the concerns who were subject to higher costs could not compete is amply borne out by the figures submitted in connection with section 1 of this report, when the profits of the United States Steel Corporation there shown are considered in connection with the profits of the so-called independent concerns, which have been stated by reliable steel manufacturers and journals to amount to from $3 to $7 profit per ton.

The Wall Street Journal, Saturday morning, September 23, 1911, in a news article under the heading "No voluntary dissolution of the United States Steel Corporation," said in part:

For the last 10 years the net profits per ton of steel produced by the Steel Corporation have ranged between $10 and $16 per ton, the latter figure having been reached in the first few years of the company's existence. For the last year the net profit per ton has not been much over $12. On the basis of present prices the net is close to $11.

While the net earnings per ton of steel produced by the Steel Corporation has ranged between $10 and $16 per ton, the independent steel companies have not fared so well. Several of the independents have not been able to show much over $4 per ton. The highest was approximately $7 per ton, by a small western independent company, whose properties represent actual cash paid in.

Independent steel representatives seem to be of the opinion that it is not

probable that the United States Steel Corporation will take any drastic dissolution measures until at least ordered or advised to do so by the Government.

One operator states that if this is done, however, it will mean a more open market for steel than exists at present, as the corporation's subsidiaries will each work independently in the matter of making prices and getting orders. The representatives of the largest independent steel companies admit that they can not make steel and sell it for what the corporation can at present, and say that the latter company, if dissolved, can certainly not retain its present methods of making steel and selling it for so great a net profit as it now does.

One steel man says: "I do not see what can be brought out against the corporation detrimental to its subsistence, with the possible exception of its railroads. These, of course, are a great source of revenue to the coffers of the company, and of course a great deal of money is saved annually in freight, especially on ores."

A man connected with another large company says that steel prices can not go much lower and have the mills operate. He says: "It seems at present that in some lines manufacturers are selling below cost, and of course this can not continue for any length of time. It may be that the companies need the cash and are compelled to get the orders even at prices shaved to the last cent."

Therefore, assuming that the statements quoted above are correct, and that the comparative figures are correct, it would seem that the combined effect of the conditions thus disclosed in the steel industry and conventions like the Gary dinners, may be said at least to have a strong tendency to render competition of no effect. (See also Report of Commissioner of Corporations on Steel Industry, p. 373 and pp. 7, 98–99, 326, 392; also pp. 4, 5, 7, 48, 50, 51, 59, 60, 75, 82, 83, 84, 240, 326.)

13. By the resolution quoted below the subsidiary companies of the United States Steel Corporation refuse to handle orders for export business, and such orders must be turned over to the United States Steel Products Export Co., the subsidiary companies preclude themselves from competing for export sales against the export company; and by other resolutions give lower prices to the export company, allowing it a percentage for expenses. The United States Steel Corporation itself in its answer claims that it now controls 90 per cent of the total export trade of the United States in steel products.

As a result of enforcing these resolutions and arrangements materials for export must be bought from the United States Steel Products (Export) Co., and buyers in the United States who wish to buy goods for export are compelled to pay an additional profit to the United Steel Products (Export) Co. These prices can not in any event affect any jobbers who are subjected to the contract drawn by the United States Steel Corporation, which provides that jobbers will carry no stock "but that manufactured by the corporation in its particular lines" and "will give up direct shipment (United States Steel Corporation minutes of general manager of sales, June 17, 1909); but all of the buyers who desire to buy for export shipment, whether jobbers or not, are compelled to submit to this arrangement.

Before the organization of the United States Steel Corporation the American Steel & Wire Co. exported wire products to the amount of over $9,000,000 between January, 1899, and December 31, 1899, or equal to 50 per cent of all exports from the United States between 1890 and 1899, and it was stated that the export business of the American Steel & Wire Co. during the first two months of 1900 presented a large and material increase over that of 1899, and for the year 1900 the export business of that company was expected to be larger than the business of 1899. (American Steel & Wire Co., N. J., stockholders' minutes, Feb. 20, 1900.)

If it be suggested that the subsidiary companies which sell to the United States Steel Products Export Co. reduce their profit in favor of the export company, no reason is seen why this reduction could not be made to any buyer for direct export except the arrangement between the companies. For example, it is stated in the minutes of the United States Steel Corporation, general manager of sales, February 21, 1906:

All material shipped direct from the mill to a point outside of the country shall be turned over to the United States Steel Products Export Co., no matter where the sale originates, and all inquiries shall be taken up with Mr. Farrell of the export company.

Upon the same date it was stated:

Mr. Farrell stated there seemed to be a difference of opinion among some of the constituent companies as to what constitutes export business, and he thought the matter should be taken up and a ruling made to govern all of the companies. Recently some material was shipped direct from the mill by the tube company that had gone out of the country, which had not been handled through the export company, and he thought if this practice continued it will have a tendency to weaken the export company.

Mr. Downer (National Tube Co.) advised that all inquiries received from them by people who are recognized exporters are immediately turned over to the export company, but there are certain domestic jobbers not recognized as exporters who ship more or less out of the country in connection with other goods, and to these people they have been quoting domestic prices direct.

After some discussion on the subject it was unanimously agreed that the following should be incorporated in the minutes as a ruling of this association:

"All material shipped direct from the mill to a point outside the country shall be turned over to the United States Steel Products Export Co., no matter where the sale originates, and all inquiries shall be taken up with Mr. Farrell."

And it was said in the minutes, under date of August 14, 1903:

It was also decided that from now on all inquiries for export shall be turned over to the export bureau.

Besides quoting "these people (i. e., domestic jobbers who sell for export) * * * domestic prices direct," as above stated, it was provided, upon December 2, 1903, and January 20, 1904, in the minutes of the general managers of sales, as follows:

Question was raised with regard to prices made to domestic manufacturers for material which will be fabricated and then exported.

Mr. Farrell stated he has a man whose duty it is to keep a careful check on all material shipped out of the country, and he will be in a position at any time to ascertain whether material sold to domestic customers for this purpose is actually exported, and will be very glad to render any assistance to the other companies that he can.

And, idem, January 20, 1904:

RECORD OF EXPORT MATERIAL SOLD TO DOMESTIC MANUFACTURERS.

After the general discussion of this matter it was recommended that the export company be furnished full data by all companies on material sold to domestic customers to be exported later, so that it will be enabled to keep a full record in this respect, which it was agreed will be done.

In considering the data touching the export business of the United States Steel Corporation it must always be kept in mind that the corporation's method of keeping accounts appears to show losses sustained by the export company, as illustrated by the statement of account of operations for 1910, appended hereunder. For example, the net earnings showed:

1903, profit, $4,223.65; operating expenses, $55,387.75.
1904, profit, $81,483.04; operating expenses, $451,010.83.
1905, loss, $99,077.41; operating expenses, $445,251.83.
1906, loss, $81,369.16; operating expenses, $514,125.96.
1907, loss, $1,685.27; operating expenses, $523,382.79.
1908, loss, $233,194.88; operating expenses, $579,690.55.
1909, loss, $156,164.27; operating expenses, $646,535.11.
1910, loss, $7,149.12; operating expenses, $771,767.22.
1910 income shows: Freight venture, chartered steamers, $225,709.83.

(NOTE.—Steamer *Bantu* was bought for £25,000, U. S. S. C., fin. com., Nov. 15, 1910.)

Now, these figures do not show the profits made before the transfer or sale to the export company, as is proved by the method of fixing the prices on sales from the other subsidiary companies to the export company.

To illustrate:

On April 4, 1904, in the minutes of the Carnegie Steel Co. directors it appears that the contract with the United States Steel Products (Export) Co. provides, among other things that the Carnegie Co. agrees that the price to be charged by it and to be paid by the export company for resale in foreign markets shall be such price as may be obtained by the export company on resale of said merchandise less such percentage as may be from time to time agreed on between the Carnegie Co. and the export company, not exceeding 5 per cent.

And under the heading of "Financial accounting and invoice department," in July, 1903, in minutes of general managers of sales, August 14, 1903, it appears:

If it is decided that it is to be operated as a general selling agency of all the companies, it will probably be necessary to have the accounts carried on the

books of the companies supplying the goods, in which case the proceeds of each individual transaction would be remitted to the manufacturing company on receipt.

In July, 1903, it was stated by the chairman of the general managers of sales of the United States Steel Corporation—

With reference to sheets and tin plate particularly, that, while their present costs would hardly permit them to export, it should be borne in mind that there is a profit to the corporation not only in the sheet bars entering into their manufacture but in the pig iron and ore as well.

We have seen that the average net profit of the Steel Corporation on all products sold to outsiders is $13 per ton; and in fact it is claimed several times that export prices were higher than domestic prices (see Gary, 3–96; Roberts, 6–363; Schwab, 18–1304; and see table of prices and tonnages exported made up by the Steel Corporation, 24–1770, 1771); and as we have seen the exports of the United States Steel Corporation are 90 per cent of the foreign trade in steel products (answer of United States Steel Corporation and others, p. 38) or 95 per cent, as asserted by Mr. Lindabury, representing the United States Steel Corporation as attorney (22–1572).

This control of 95 per cent or "upward of 90 per cent of the total foreign trade of the country in steel products" has been made possible by the consolidation of control in the United States Steel Corporation, it is claimed, or as stated in the words of Mr. E. H. Gary (3–104):

I believe these companies could not do one-half or one-fourth of the export business which we do if they were segregated or divided.

And, again, in considering the figures set forth above, it must be noted that in October, 1903, the export company was allowed a commission of 3 per cent (which was reduced to 2 per cent in Mar. 23, 1904), and it was provided that—

Any surplus over and above the actual requirements (of the export company) is to be rebated to the different companies predicated on the value of the tonnage sold for them.

UNITED STEEL PRODUCTS (EXPORT) CO.

The operations of this company can be illustrated by its income and charges for the year 1910.

Income:

Commissions received from subsidiary companies' account, export sales	$516,636.42
Interest and discount	36,358.10
Miscellaneous income	42,906.81
Foreign exchange, adjustment account	23,701.12
Commissions on pig-tin purchases and palm-oil purchases	12,447.38
Freight venture, chartered steamers	225,709.83
	857,759.75

Charges:	
Operating expenses, administrative and selling	$771,767.22
Provision for contingent fund and unaudited liability	50,000.00
Employees' bonus fund	39,695.00
Taxes, State and local	3,446.65
	864,908.87
Showing a deficit on the year of	7,149.12

14. Percentages of the business done by the United States Steel Corporation are deceiving and misleading unless segregated with reference to particular products. For example, Mr. Roosevelt refers to an estimate that the United States Steel Corporation did not have above 60 per cent "of steel properties" (19–1370) or "steel holdings" (19–1379), and when he was asked if Gary and Frick said anything about the ore properties that they were buying at that time he answered, "They did not go into details at all" (19–1379), and he also stated that he understood they were going to buy the Tennessee company's "plant" (19–1379). If this estimate of 60 per cent refers to property and investment in the steel business, it may be noted in that year (1907) that the total property of the Bethlehem, Cambria, Colorado, Lackawanna, Pennsylvania, and Tennessee companies added to the capital stock of Jones & Laughlin (because statement of property is not available) amounted to $365,768,889, from the best sources available, i. e., Moody's Manual (3–116, 117), etc., these companies being the only important concerns in the steel business in the United States outside of the United States Steel Corporation. This amount, added to that of the United States Steel Corporation, equals a grand total of $1,811,606,339, of which the property account of the United States Steel Corporation amounts to $1,445,837,450, or about 80 per cent.

And, as we have seen, the Minnesota Tax Commission estimated the United States Steel Corporation's percentage of ore at 76 per cent in 1907 and 80 per cent in 1909 in Minnesota (see Report Com. Corp., pp. 378–379).

The Minnesota ore is the basis of the steel industry (Rep. Com. Corp., pp. 58, 380), and is the most available ore (Gary (3–83).

The estimate that the United States Steel Corporation controls 50 per cent of the available ore in the United States and that there are billions of tons in the United States (3–80, 83; 4–215), as far as this is suggested as bearing upon or affecting the state of competition in the steel business, finds a striking commentary in the actual conduct of the large steel corporations, viz:

(1) The United States Steel Corporation has acquired some 100,000,000 tons of iron ore in Cuba, while the Bethlehem Company, now managed by the former president of the United States Steel

Corporation, is said to have acquired 17,000,000 tons in Cuba, notwithstanding the wetness of the ore and the carriage of it and need for concentration, and other large concerns have acquired proportionately large holdings there (15–1028, 1029).

(2) The United States Steel Corporation's subsidiary companies have constantly purchased ore from other sellers. (See summary of evidence "Ore purchases, year by year.")

(3) Notwithstanding the purchase for about $1,207,000 of the plant, including blast furnaces of the Troy Co., as Mr. Gary said, to utilize New York ore (4–213), these furnaces have been allowed to remain idle, while about the time that the said purchase was suggested the United States Steel Corporation bought for the American Steel & Wire Co. the output of 100 to 175 tons of pig iron per day from April 1 to December 1, 1902, from the Cedar Point, Port Henry, N. Y., furnaces of Piling & Crane. (A. S. W. Co., dir. min., Feb. 18, 1902.)

And as to the percentages given in the reports of the American Iron & Steel Association (which are accepted by the United States Steel Corporation (5–224, 225), and to which association, managed by Mr. Swank, the Steel Corporation contributes money), it will be seen that higher percentages are given for the year 1907 than this estimate of 60 per cent, to wit (as the figures are shown in the report of Commissioner of Corporations, p. 362):

	Per cent.
Wire-rods production of United States Steel Corporation (in 1907)	71.5
Wire-nails production of United States Steel Corporation (in 1907)	66.4
Tin plates and terne plates of United States Steel Corporation (not given for 1907, but for 1908)	72
Although for 1907 there is given in the report from the American association statistics "plates and sheets," which are said in a note to include black plates for tinning and excluding nail plates	55.8

But combined percentages appear upon their face to be averaged, for example, in the year 1907 there is given—

	Per cent.
Bars, skelp, nail plate, open hearth, and iron rails, and other finished rolled products	33.9

Now, this percentage is misleading, because it appears that the United States Steel Corporatioin makes no iron rails for sale, as far as is shown, and did not make open-hearth rails until 1908 (Report Com. Corp., p. 364, note 4), while of skelp, which is used for tubes and pipes, it undoubtedly made a large percentage; and as to "other finished rolled products" it is impossible to say whether it includes a large number of products of which the Steel Corporation produces little or no percentage. But, at any rate, it is clear that any such combined percentages, added together and shown as an averaged per-

centage, are not only valueless for serious comparison, but misleading.

In connection with this subject, the fact that the Steel Corporation does not sell raw or semifinished products should be kept well in mind to emphasize the importance of percentages of finished products, which are stated separately.

Supplementary and additional matter will be submitted in a supplemental report.

Paraphrasing the language of the honorable Herbert Knox Smith, Commissioner of Corporations, in submitting his data in regard to costs to the Ways and Means Committee in 1908, it may be said that these results appear simple and are stated in comparatively small space, but they cover the essentially important data and accounts of the largest corporation in the United States, including within its operations those of about 12 major concerns which control over 180 subsidiary corporations throughout the United States in various lines of business. This means an enormous volume of tonnage mined, transported, smelted, manufactured, finished, and fabricated and an enormous mass of transactions. As was said in the connection just referred to, "I think it is safe to say that no such complete or accurate figures have been compiled in this country (in relation to this corporation), and that while they necessarily involve some variations, these are small in amount, and nothing approaching this statement in reliability can be obtained from any other source."

In concluding this report, I desire to state that the data or information contained herein and in its accompanying exhibits represent an endeavor to cover as much ground in relation to the affairs of the United States Steel Corporation as the time, the money, and the conditions surrounding the work would permit, but it will be appreciated by those who are familiar with the size and complexity of the task that a more exhaustive examination of the records and evidence and a more lengthy analysis and presentation of it would require a great deal larger expenditure of time and money and the services of a much larger force than was at my command.

Respectfully submitted.

FARQUHAR J. MACRAE,
Certified Public Accountant, State of New York.

EXHIBITS.

[NOTE.—All figures in italics represent deductions, or figures written in red ink in the original report.]

	Grand total.	*Elimination of intercompany interest and adjustments of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$126,878,630.54			$58,356,158.45	$18,716,017.74	$49,806,454.35		
To outside customers	398,232,743.65			389,245,402.26	4,864,814.23	4,122,527.16		
Gross earnings from operations of transportation and miscellaneous companies	38,649,129.60						$33,778,544.64	$4,870,584.96
Total gross sales and earnings	563,760,503.79			447,601,560.71	23,580,831.97	53,928,981.51	33,778,544.64	4,870,584.96
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	98,410,281.93			47,839,067.75	12,353,894.62	38,217,319.56		
To outside customers	300,293,417.58			294,076,685.43	2,640,163.90	3,576,568.25		
Operating expenses of transportation and miscellaneous companies	21,810,549.71						18,522,833.18	3,287,716.53
Total operating charges	420,514,249.22			341,915,753.18	14,994,058.52	41,793,887.81	18,522,833.18	3,287,716.53
Deduct extinguishment funds and depreciation and replacement funds charged through costs	5,290,521.53			1,962,875.12		1,881,008.68	1,446,037.73	
Net operating charges	415,223,727.69			339,952,878.06	14,994,058.52	39,912,279.13	17,076,795.45	3,287,716.53
Administrative, selling, and general expenses	9,844,186.59		$1,023,770.22	7,756,868.96	373,098.59	690,448.82		
Taxes, state and local	2,531,741.29		111,959.52	1,169,076.26	207,327.92	557,815.47	444,633.89	40,928.23
Insurance not charged through costs	323,401.92			289,828.02	33,363.86	210.04		
Commercial discounts and interest	2,202,284.00			2,186,153.07		9,694.71	6,436.22	
Exploration expenses on properties abandoned	239,804.45					239,804.45		
Miscellaneous	13,718.30			13,718.30				
Total operating charges and general expenses	430,378,864.24		1,135,729.74	351,368,522.67	15,607,848.89	41,410,252.62	17,527,865.56	3,328,644.76
Balance	133,381,639.55		*1,135,729.74*	96,233,038.04	7,972,983.08	12,518,728.89	16,250,679.08	1,541,940.20
Sundry manufacturing and operating gains and *losses* (net)	4,597,888.93		171,036.61	3,035,448.63	599,084.82	528,467.06	254,377.84	9,473.97
Other income	3,845,985.68	*$1,916,016.87*	1,403,555.23	1,914,786.18	428,811.73	1,500,058.45	278,044.45	236,746.51
Total income before interest charges	141,825,514.16	*1,916,016.87*	438,862.10	101,183,272.85	9,000,879.63	14,547,254.40	16,783,101.37	1,788,160.68
Interest charges	6,195,436.81	*1,916,016.87*	149,707.78	1,575,312.72	402,146.34	536,079.57	5,446,822.72	1,384.55
Balance	135,630,077.35		289,154.32	99,607,960.13	8,598,733.29	14,011,174.83	11,336,278.65	1,786,776.13

Less profits included above by subsidiary companies on account of material in transit not yet taken up								
Total earnings	135,630,077.35		289,154.32	99,607,960.13	8,598,733.29	14,011,174.83	11,336,278.65	1,786,776.13
Less (set aside for depreciation and extraordinary renewals):								
Bond sinking fund	624,064.43						624,064.43	
Depreciation and extinguishment funds	4,334,710.28			273,998.46	1,372,079.12	2,493,964.78	504,783.68	189,884.24
Extraordinary replacement funds	6,108,238.72			5,960,348.85	94,664.39		1,999.49	51,225.99
Do	3,207,376.04			1,761,338.31			1,446,037.73	
Special depreciation and improvement funds	10,000,000.00			8,700,000.00	350,000.00	600,000.00	350,000.00	
Net earnings before deducting bonus funds	110,355,687.88		289,154.32	82,912,274.51	6,781,989.78	10,917,210.05	8,409,393.32	1,545,665.90
Employees' bonus fund	2,321,313.63		314,148.00	1,560,565.81	75,500.00	128,959.81	227,474.14	14,665.87
Net earnings carried to surplus (Exhibit 21)	108,534,374.25		*24,993.68*	81,351,708.70	6,706,489.78	10,788,250.24	8,181,919.18	1,531,000.03

	Grand total.	*Elimination of intercompany interest and adjustments of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$126,878,630.54			$58,356,158.45	$18,716,017.74	$49,806,454.35		
To outside customers	398,232,743.65			389,245,402.26	4,864,814.23	4,122,527.16		
Gross earnings from operations of transportation and miscellaneous companies	38,649,129.60						$33,778,544.64	$4,870,584.96
Total gross sales and earnings	563,760,503.79			447,601,560.71	23,580,831.97	53,928,981.51	33,778,544.64	4,870,584.96
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	98,410,281.93			47,839,067.75	12,353,894.62	38,217,319.56		
To outside customers	300,293,417.58			294,076,685.43	2,640,163.90	3,576,568.25		
Operating expenses of transportation and miscellaneous companies	21,810,549.71						18,522,833.18	3,287,716.53
Total operating charges	420,514,249.22			341,915,753.18	14,994,058.52	41,793,887.81	18,522,833.18	3,287,716.53
Deduct extinguishment funds and depreciation and replacement funds charged through costs	5,290,521.53			1,962,875.12		1,881,608.68	1,446,037.73	
Net operating charges	415,223,727.69			339,952,878.06	14,994,058.52	39,912,279.13	17,076,795.45	3,287,716.53
Administrative, selling, and general expenses	9,844,186.59		$1,023,770.22	7,756,868.96	373,098.59	690,448.82		
Taxes, state and local	2,531,741.29		111,959.52	1,169,076.26	207,327.92	557,815.47	444,633.89	40,928.23
Insurance not charged through costs	323,401.92			289,828.02	33,363.86	210.04		
Commercial discounts and interest	2,202,284.00			2,186,153.07		9,694.71	6,436.22	
Exploration expenses on properties abandoned	239,804.45					239,804.45		
Miscellaneous	13,718.30			13,718.30				
Total operating charges and general expenses	430,378,864.24		1,135,729.74	351,368,522.67	15,607,848.89	41,410,252.62	17,527,865.56	3,328,644.76
Balance	133,381,639.55		*1,135,729.74*	96,233,038.04	7,972,983.08	12,518,728.89	16,250,679.08	1,541,940.20
Sundry manufacturing and operating gains and *losses* (net)	4,507,888.93		171,036.61	3,035,448.63	599,084.82	528,467.06	254,377.84	9,473.97
Other income	3,845,985.68	*$1,916,016.87*	1,403,555.23	1,914,786.18	428,811.73	1,500,058.45	278,044.45	236,746.51
Total income before interest charges	141,825,514.16	*1,916,016.87*	438,862.10	101,183,272.85	9,000,879.63	14,547,254.40	16,783,101.37	1,788,160.68
Interest charges	6,195,436.81	*1,916,016.87*	149,707.78	1,575,312.72	402,146.34	536,079.57	5,446,822.72	1,384.55
Balance	135,630,077.35		289,154.32	99,607,960.13	8,598,733.29	14,011,174.83	11,336,278.65	1,786,776.13

Less profits included above by subsidiary companies on account of material in transit not yet taken up			280,154.32	99,607,960.13	8,598,733.29	14,011,174.83	11,336,278.65	1,786,776.13	
Total earnings	135,630,077.35								
Less (set aside for depreciation and extraordinary renewals):									
Bond sinking fund	624,064.43			279,998.46	1,372,079.12	2,493,964.78	624,064.43		190,884.24
Depreciation and extinguishment funds	4,854,710.28			5,960,348.88	94,664.39		504,783.68		51,228.99
Extraordinary replacement funds	6,105,228.72			1,761,338.31			1,990.49		
Do	2,207,870.04						1,446,037.73		
Special depreciation and improvement funds	10,000,000.00			8,700,000.00	350,000.00	600,000.00	350,000.00		
Net earnings before deducting bonus funds	110,858,687.88		280,154.32	82,912,274.51	6,781,989.78	10,917,210.06	8,409,393.32	1,545,665.90	
Employees' bonus fund	2,321,313.63		314,148.00	1,560,565.81	75,500.00	128,969.81	227,474.14	14,665.87	
Net earnings carried to surplus (Exhibit 21)	108,534,374.25		24,006.68	81,351,708.70	6,706,489.78	10,788,250.24	8,181,919.18	1,531,000.03	

EXHIBIT 2.—*Summary of general profit and loss account of all companies for year 1903.*

	Grand total.	*Elimination of intercompany interest and adjustment of other accounts.*	United States Steel Corporation, Carnegie Co., Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron-mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$116,556,916.66			$48,585,583.48	$21,791,463.69	$46,179,869.49		
To outside customers	381,770,225.15			378,466,068.96	972,316.98	2,331,839.21		
Gross earnings from operations of transportation and miscellaneous companies	37,323,120.06						$32,456,205.10	$4,866,914.96
Sales adjustments	*1,645,021.77*			*1,645,021.77*				
Total gross sales and earnings	534,105,240.12			425,506,630.67	22,763,780.67	48,511,708.70	32,456,205.10	4,866,914.96
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	85,820,816.35			42,790,593.47	11,474,354.85	31,555,868.03		
To outside customers	301,695,137.14			299,112,721.75	430,888.37	2,151,527.02		
Operating expenses of transportation and miscellaneous companies	21,601,006.40						18,318,835.04	3,282,171.36
Cost adjustments	1,919,710.70	$1,015,855.88		903,854.82				
Total operating charges	411,036,670.59	1,015,855.88		342,807,170.04	11,905,243.22	33,707,395.05	18,318,835.04	3,282,171.36
Deduct extinguishment funds and depreciation and replacement funds charged through costs	4,696,628.68			1,331,571.08		1,878,337.37	1,486,720.23	
Net operating charges	406,340,041.91	1,015,855.88		341,475,598.96	11,905,243.22	31,829,057.68	16,832,114.81	3,282,171.36
Administrative, selling, and general expenses	9,811,324.10		$1,417,193.00	7,517,321.24	360,652.88	516,156.98		
Taxes, State and local	3,026,011.99		93,336.99	1,459,276.74	223,331.53	683,262.41	503,645.72	63,158.60
Insurance not charged through costs	*392.91*			*51,298.02*	45,426.78	5,478.33		
Commercial discounts and interest	1,864,796.35			1,850,307.63		14,488.72		
Exploration expense on properties abandoned	388,845.73					388,845.73		
Miscellaneous expense	20,331.31		1,537.95	18,793.36				
Total operating charges and general expense	421,450,958.48	1,015,855.88	1,512,067.94	352,269,999.91	12,534,654.41	33,437,289.85	17,335,760.53	3,345,329.96
Balance	112,654,281.64	*1,015,855.88*	*1,512,067.94*	73,236,630.76	10,229,126.26	15,074,418.85	15,120,444.57	1,521,585.02
Sundry manufacturing and operating gains and *losses* (net)	1,110,370.73	309,579.67		*251,706.29*	498,282.45	517,840.94	33,947.11	2,426.85
Other income	3,872,491.35	*2,518,042.87*	1,292,754.30	2,848,514.72	346,783.69	1,400,058.90	55,286.63	247,185.38
Total income before interest charges	117,637,143.72	*3,024,318.48*	*219,313.64*	75,833,439.19	11,074,192.40	16,992,318.69	15,209,628.31	1,771,197.25

Interest charges	6,510,344.29	*3,024,518.48*	315,034.27	3,328,660.72	306,529.15	426,081.61	5,157,875.03	481.99
Balance	111,126,799.43		*534,347.91*	72,504,778.47	10,767,663.25	16,566,237.08	10,051,753.28	1,770,715.26
Less profits included above by subsidiary companies on account of materials in transit not yet taken up								
Total earnings	111,126,799.43		*534,347.91*	72,504,778.47	10,767,663.25	16,566,237.08	10,051,753.28	1,770,715.26
Less (set aside for depreciation and extraordinary renewals):								
Bond sinking fund	1,598,012.48			953,921.07	9,636.28		634,455.13	
Depreciation and extinguishment funds	4,598,676.81			279,615.54	1,254,114.96	2,408,171.19	466,320.35	190,454.77
Extraordinary replacement funds	6,602,105.32			5,837,027.33	194,131.56	219,818.21	330,332.14	20,796.08
Do	2,695,425.57			1,166,751.12		41,954.22	1,486,720.23	
Special depreciation and improvement funds	2,332,940.61			2,332,940.61				
Do	[1] 7,667,059.39			[1] 7,667,059.39				
Net earnings before deducting bonus fund	85,632,579.25		*534,347.91*	54,267,463.41	9,309,780.45	13,896,293.46	7,133,925.43	1,559,464.41
Employees' bonus fund and special compensation account preferred-stock subscriptions	1,956,792.74		775,156.00	845,690.63	99,990.00	112,619.11	109,959.00	13,378.00
Net earnings carried to surplus (Exhibit 21)	83,675,786.51		*1,309,503.91*	53,421,772.78	9,209,790.45	13,783,674.35	7,023,966.43	1,546,086.41

[1] *This amount was subsequently charged to construction.*

EXHIBIT 3.—*Summary of general and profit and loss account of all companies for the year 1904.*

	Grand total.	*Elimination of inter-company interest and adjustment of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$102,760,067.45	*$1,722,336.84*		$51,944,059.26	$15,893,299.46	$36,645,035.57		
To outside customers	306,229,871.71			304,523,355.00	281,920.14	1,424,596.57		
Gross earnings from operations of transportation and miscellaneous companies	35,331,671.12						$30,602,041.80	$4,729,629.32
Sales adjustments	*1,416,166.15*			*1,416,166.15*				
Total gross sales and earnings	442,905,444.13	*1,722,336.84*		355,051,248.11	16,175,219.60	38,069,632.14	30,602,041.80	4,729,629.32
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	84,848,554.17	*1,243,128.25*		45,840,912.28	10,726,763.42	29,524,006.72		
To outside customers	250,206,433.14	*479,198.59*		249,131,373.22	149,085.97	1,405,172.54		
Operating expenses of transportation and miscellaneous companies	19,894,886.38						16,627,264.94	3,267,621.44
Cost adjustments	2,424,740.52	1,593,058.06		831,682.46				
Total operating charges	357,374,614.21	*129,268.78*		295,803,967.96	10,875,849.39	30,929,179.26	16,627,264.94	3,267,621.44
Deduct extinguishment funds and depreciation and replacement funds charged through costs	4,451,990.41			1,431,557.30	230,649.04	1,360,240.83	1,429,543.24	
Net operating charges	352,922,623.80	*129,268.78*		294,372,410.66	10,645,200.35	29,568,938.43	15,197,721.70	3,267,621.44
Administrative, selling, and general expenses	8,965,999.27		$1,311,295.18	6,892,242.54	344,716.80	417,744.75		
Taxes, State and local	3,102,857.10		86,491.94	1,460,149.17	263,723.62	765,817.57	492,947.45	33,727.35
Insurance not charged through costs	10,870.91			*44,299.43*	55,170.33			
Commercial discounts and interest	2,314,064.23	*825.27*		2,316,715.45			*2,873.19*	1,047.24
Exploration expense on properties abandoned	117,545.30					117,545.30		
Miscellaneous expense	683,923.08		589,919.98	21,232.06		72,771.00		
Total operating charges and general expenses	368,117,883.64	*130,094.05*	1,987,707.10	305,018,450.45	11,308,811.10	30,942,817.05	15,687,795.96	3,302,396.03
Balance	74,787,560.49	*1,592,242.79*	*1,987,707.10*	50,032,797.66	4,866,408.50	7,126,815.09	14,914,245.84	1,427,233.29
Sundry manufacturing and operating gains and *losses*, net	1,430,099.52	687,488.72		*105,124.19*	473,658.52	295,991.82	76,811.96	1,272.69
Other income	2,701,501.51	*1,900,435.57*	1,225,353.47	2,099,722.49	45,785.61	988,522.16	71,259.77	171,293.58
Total income before interest charges	78,919,161.52	*2,805,179.64*	*762,353.63*	52,027,395.96	5,385,852.63	8,411,329.07	15,062,317.57	1,599,799.56
Interest charges	6,594,956.25	*2,758,758.57*	115,105.73	3,453,906.12	246,359.68	386,294.35	5,151,589.87	459.07
Balance	72,324,205.27	*46,421.07*	*877,459.36*	48,573,489.84	5,139,492.95	8,025,034.72	9,910,727.70	1,599,340.49

Add profits included above by subsidiary companies on account of materials in transit not yet taken up	1,254,336.48	1,254,336.48						
Total earnings	73,578,541.75	1,207,915.41	*877,459.36*	48,573,489.84	5,139,492.95	8,025,084.72	9,910,727.70	1,599,340.49
Less (set aside for depreciation and extraordinary renewals):								
Bond sinking funds	1,583,116.76			713,630.78	26,602.36		842,883.02	
Depreciation and extinguishment funds	3,907,166.55			172,786.66	1,301,953.66	1,812,644.58	422,842.01	196,939.64
Extraordinary replacement funds	5,705,338.69			4,936,450.96	371,536.70	100,759.55	261,069.67	35,521.71
Do	2,960,157.19			1,275,073.97	230,649.04	24,890.94	1,429,543.24	
Net earnings before deducting bonus fund	59,422,762.56	1,207,915.41	*877,459.36*	41,475,547.47	3,208,751.19	6,086,739.55	6,954,389.16	1,366,879.14
Employees' bonus fund and special compensation account preferred stock subscriptions	1,631,565.76		633,568.50	793,645.00	41,495.00	78,907.26	73,180.00	10,770.00
Net earnings carried to surplus (Exhibit 21)	57,791,196.80	1,207,915.41	*1,511,027.86*	40,681,902.47	3,167,256.19	6,007,832.29	6,881,209.16	1,356,109.14

	Grand total.	*Elimination of intercompany interest and adjustments of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron-mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$152,925,455.69	*$2,916,838.55*		$73,316,767.45	$24,143,761.77	$58,381,765.02		
To outside customers	383,721,572.42			381,276,251.78	956,143.93	1,489,176.71		
Gross earnings from operations of transportation and miscellaneous companies	49,338,061.87						$43,560,261.43	$5,777,800.44
Sales adjustments	197,563.04			*28,048.84*	225,605.88			
Total gross sales and earnings	586,182,653.02	*2,916,838.55*		454,564,976.39	25,325,511.58	59,870,941.73	43,560,261.43	5,777,800.44
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	120,824,960.54	*1,963,704.89*		62,208,076.05	16,131,108.80	44,449,480.58		
To outside customers	300,885,814.18	*953,133.66*		299,667,830.28	640,849.26	1,530,268.30		
Operating expenses of transportation and miscellaneous companies	25,588,436.05						21,348,308.31	4,240,127.74
Cost adjustments	*8,565.38*	250,642.77		*259,208.15*				
Total operating charges	447,290,645.39	*2,666,195.78*		361,616,698.18	16,771,958.06	45,979,748.88	21,348,308.31	4,240,127.74
Deduct extinguishment funds and depreciation and replacement funds charged through costs	6,043,997.93			2,186,071.50	321,347.19	2,053,754.11	1,482,825.13	
Net operating charges	441,246,647.46	*2,666,195.78*		359,430,626.68	16,450,610.87	43,925,994.77	19,865,483.18	4,240,127.74
Administrative, selling, and general expenses	9,517,695.92		$1,006,137.83	7,490,482.54	447,495.29	571,580.26		
Taxes, State and local	3,681,122.53		86,023.79	1,525,412.10	300,379.24	846,989.36	883,080.28	39,237.76
Insurance not charged through costs	4,140.83			*58,992.50*	63,133.33			
Commercial discounts and interest	2,996,955.27	*1,904.10*		2,994,587.26		8,782.71	*6,414.70*	1,904.10
Rentals	23,110.57	*881,655.73*					904,766.30	
Miscellaneous	76,816.22			76,239.13		*110.41*		687.50
Total operating charges and general expenses	457,546,488.80	*3,549,755.61*	1,094,161.62	371,458,355.21	17,261,618.73	45,353,236.69	21,646,915.06	4,281,957.10
Balance	128,636,164.22	632,917.06	*1,094,161.62*	83,106,621.18	8,063,892.85	14,517,705.04	21,913,346.37	1,495,843.34
Sundry manufacturing and operating gains and *losses*, net	2,962,555.32	*634,573.81*		1,861,433.18	693,630.08	955,125.30	89,733.26	*2,792.69*
Other income	3,492,586.49	*2,995,415.01*	2,340,791.32	2,223,272.06	279,274.17	1,052,254.48	341,790.15	248,619.32
Total income before interest charges	135,091,306.03	*2,995,071.76*	1,246,629.70	87,191,326.42	9,036,797.10	16,525,084.82	22,344,869.78	1,741,669.97
Interest charges	6,694,618.89	*2,995,415.01*	197,290.81	4,148,821.57	405,648.59	428,326.70	4,489,904.05	18,042.18
Balance	128,396,687.14	*1,658.75*	1,049,338.89	83,042,504.85	8,631,148.51	16,096,758.12	17,854,965.73	1,723,627.79

Less profits included above by subsidiary companies on account of materials in transit not yet taken up	6,307,189.85	6,307,189.85						
Total earnings	122,089,497.31	6,908,846.68	1,049,338.89	83,042,504.85	8,631,148.51	16,066,768.12	17,854,905.73	1,723,627.70
Less (set aside for depreciation and extraordinary renewals):								
Bond sinking fund	1,689,999.46			833,743.35	62,273.21		793,982.90	
Depreciation and extinguishment funds	5,844,981.17			168,694.06	1,819,271.73	2,870,761.92	671,725.20	314,528.26
Extraordinary replacement funds	9,744,900.51			6,710,968.54	1,087,277.85	224,230.84	1,514,076.80	188,446.48
Do	3,843,009.36			12,020,264.92	321,347.19	18,882.12	1,482,826.13	
Special depreciation and improvement funds	2,222,172.00			1,000,000.00			1,222,172.00	
Net earnings before deducting bonus funds	98,734,434.81	6,908,846.68	1,049,338.89	72,308,943.98	5,330,978.53	12,973,183.24	12,160,183.70	1,220,653.06
Employees' bonus fund and special compensation account, preferred stock	2,301,838.88		836,704.50	1,144,974.00	66,444.00	113,171.38	115,418.00	25,127.00
Net earnings carried to surplus (Exhibit 21)	96,432,595.93	6,908,846.68	212,634.39	71,163,969.98	5,264,534.53	12,860,011.86	12,044,765.70	1,195,526.06

	Grand total.	*Elimination of intercompany interests and adjustments of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$199,276,628.62	*85,866,808.94*		$104,165,984.82	$29,180,246.85	$71,796,605.89		
To outside customers	454,233,639.96			452,740,221.84	122,585.48	1,370,832.64		
Gross earnings from operations of transportation and miscellaneous companies	53,782,044.67						$47,775,493.46	$6,006,551.21
Sales adjustments	*35,850.16*			*27,777.58*	*8,072.58*			
Total gross sales and earnings	707,256,463.09	*5,866,808.94*		556,878,429.08	29,294,759.75	73,167,438.53	47,775,493.46	6,006,551.21
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	149,067,719.52	*4,313,518.52*		85,391,547.06	18,599,817.01	49,389,873.77		
To outside customers	355,504,820.20	*1,552,690.62*		355,510,030.16	62,843.67	1,484,636.99		
Operating expenses of transportation and miscellaneous companies	28,716,043.99						24,257,820.58	4,458,223.41
Cost adjustments	849,486.51	149,169.04		693,445.45	6,872.02			
Total operating charges	534,138,070.22	*5,717,089.90*		441,595,022.67	18,669,532.70	50,874,510.76	24,257,820.58	4,458,223.41
Deduct extinguishment funds and depreciation and replacement funds charged through costs	6,509,870.76			2,486,216.76	345,991.25	2,090,750.44	1,586,912.31	
Net operating charges	527,628,199.46	*5,717,089.90*		439,108,805.91	18,323,541.45	48,783,760.32	22,670,908.27	4,458,223.41
Administrative, selling, and general expenses	10,293,235.74		1,002,719.74	8,213,237.62	501,394.24	575,884.14		
Taxes, State and local	4,357,603.42	100.00	85,706.63	1,607,143.98	327,337.04	1,306,075.44	987,380.02	43,860.31
Insurance not charged through costs	12,606.53			*58,769.75*	71,376.28			
Commercial discounts and interest	3,654,888.38			3,655,201.14		6,414.49	*6,787.25*	
Miscellaneous	119,507.67	*2,150.00*		18,447.82		114,886.61		*11,676.76*
Total operating charges and general expenses	546,066,041.20	*5,719,089.90*	1,088,426.37	452,544,066.72	19,223,649.01	50,787,021.00	23,651,561.04	4,490,406.96
Balance	161,190,421.89	*147,119.04*	*1,088,426.37*	104,334,362.36	10,071,110.74	22,380,417.53	24,123,932.42	1,516,144.25
Sundry manufacturing and operating gains and *losses* (net)	3,254,946.06	148,560.83		2,302,353.82	699,645.18	884,918.79	*781,735.00*	1,202.44
Other income	5,403,113.68	*3,965,841.69*	3,625,730.78	3,254,535.68	543,326.96	1,174,696.88	459,756.14	310,908.93
Total income before interest charges	169,848,481.63	*3,964,899.90*	2,537,304.41	109,891,251.86	11,314,082.88	24,440,033.20	23,801,953.56	1,828,255.62
Interest charges	6,559,794.01	*3,951,605.22*	181,003.59	4,792,345.34	415,125.49	433,301.49	4,043,406.46	46,216.86
Balance	163,288,687.62	*13,794.68*	2,356,300.82	105,098,906.52	10,898,957.39	24,006,731.71	19,158,547.10	1,782,038.76

Less profits included above by subsidiary companies on account of materials in transit, not yet taken up	$3,739,408.74	$3,739,408.74						
Total earnings	100,549,283.88	$3,758,198.48	2,356,300.82	105,006,906.52	10,898,967.39	24,006,731.71	19,158,547.10	1,782,088.76
Less (set aside for depreciation and extraordinary renewals):								
Bond sinking funds	1,904,063.50			843,697.89	103,167.73		956,997.83	
Depreciation and extinguishment funds	5,857,410.91			144,670.35	1,941,156.42	2,827,602.04	703,872.46	240,019.04
Extraordinary replacement fund	11,069,652.67			7,449,942.61	673,361.69	345,922.39	2,085,326.25	497,099.73
Do	4,336,207.97			2,350,096.41	345,991.25	53,208.00	1,586,912.31	
Special depreciation and improvement fund	7,500,000.00			7,500,000.00				
Net earnings before deducting bonus funds	129,801,948.83	$3,758,198.48	2,356,300.82	86,810,299.26	7,835,290.30	20,779,906.68	13,817,438.20	1,044,919.99
Employees' bonus fund and special compensation to employees' account stock subscriptions	3,925,010.70		1,268,458.25	2,078,797.00	123,696.40	204,948.45	211,104.00	38,006.60
Net earnings carried to surplus (Exhibit 21)	125,966,938.13	$3,758,198.48	1,087,842.57	84,731,502.26	7,711,593.90	20,574,960.23	13,606,334.20	1,006,913.39

EXHIBIT 6.—*Summary of general and profit and loss account of all companies for year 1907.*

	Grand total.	*Elimination of intercompany interest and adjustment of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron-mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$226,153,219.69	*$5,396,885.04*		$110,008,984.85	$30,160,762.32	$91,380,357.56		
To outside customers	473,223,462.86			471,426,018.19	33,636.86	1,763,807.81		
Gross earnings from operation of transportation and miscellaneous companies	57,837,472.91	*7,965.61*					$51,458,639.89	$6,386,798.63
Sales credited to construction	*140,422.21*				*140,422.21*			
Sales adjustments	*125,593.97*			*133,165.27*	7,571.30			
Total gross sales and earnings	756,948,139.28	*5,404,850.65*		581,301,837.77	30,061,548.27	93,144,165.37	51,458,639.89	6,386,798.63
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	166,572,582.08	*4,905,555.67*		94,884,929.44	21,573,627.35	54,319,580.96		
To outside customers	369,466,731.44	*1,191,529.37*		368,878,430.61	17,358.74	1,762,271.46		
Operating expenses of transportation and miscellaneous companies	33,413,188.62						28,548,698.94	4,864,489.68
Cost adjustments	150,918.26	129,859.45		20,748.76	310.05			
Total operating charges	569,603,420.40	*5,967,085.59*		463,784,108.81	21,591,296.14	56,081,852.42	28,548,698.94	4,864,489.68
Deduct extinguishment funds and depreciation and replacement funds charged through costs (see below)	5,498,251.68			144,687.23	319,459.89	3,046,707.98	1,987,396.58	
Net operating charges	564,105,168.72	*5,967,085.59*		463,639,421.58	21,271,836.25	53,035,144.44	26,561,302.36	4,864,489.68
Administrative, selling, and general expenses	11,177,674.18		$1,030,612.96	8,930,106.99	533,932.44	560,825.78		122,196.01
Taxes, State and local	5,390,943.29		85,765.41	1,768,165.24	396,851.34	1,998,236.37	1,085,304.37	56,620.56
Insurance not charged through costs	*41,475.30*			*41,475.30*				
Commercial discounts and interest	3,952,011.65			3,952,011.65				
Rentals paid outside companies	64,070.56						64,070.56	
Total operating charges and general expenses	584,648,393.10	*5,967,085.59*	1,116,378.37	478,248,230.16	22,202,620.03	55,594,206.59	27,710,677.29	5,043,306.25
Balance	172,299,746.18	*137,825.06*	*1,116,378.37*	103,053,607.61	7,858,928.24	37,549,958.78	23,747,962.60	1,343,492.38
Sundry manufacturing and operating gains and losses (net)	3,197,474.70	102,213.30	1,422.44	1,549,730.85	690,299.46	587,576.44	261,713.39	4,518.82
Other income	6,485,338.47	*3,718,115.61*	4,714,632.51	2,717,829.09	455,421.86	1,284,013.84	700,350.61	331,206.17
Total income before interest charges	181,982,559.35	*3,753,727.37*	3,599,676.58	107,321,167.55	9,004,649.56	39,421,549.06	24,710,026.60	1,679,217.37
Interest charges	6,495,542.34	*3,718,115.61*	83,526.24	4,749,737.72	340,604.79	393,641.81	4,599,427.21	46,720.18
Balance	175,487,017.01	*35,611.76*	3,516,150.34	102,571,429.83	8,664,044.77	39,027,907.25	20,110,599.39	1,632,497.19

Less profits included above by subsidiary companies on account of materials in transit not yet taken up	*9,744,692.51*	*9,744,692.51*						
Total earnings	165,742,324.50	*9,780,304.27*	3,516,150.34	102,571,429.83	8,664,044.77	39,027,907.25	20,110,599.39	1,632,497.19
Less (set aside for depreciation and extraordinary renewals):								
Bond sinking fund	1,977,761.03			848,943.16	97,848.94		1,016,385.60	14,583.33
Depreciation and extinguishment fund	3,656,644.83			29,005.52	1,786,144.48	1,127,360.41	705,309.09	8,825.33
Extraordinary replacement fund	13,237,086.90			10,032,509.64	307,795.47	266,541.13	2,115,497.12	514,743.54
Special improvement fund	3,350,000.00			3,100,000.00	250,000.00			
Depreciation funds	3,025,101.20			139,022.39		2,886,078.81		
Extraordinary replacement fund	2,473,150.48			5,664.84	319,459.89	160,629.17	1,987,396.58	
Net earnings before deducting bonus fund	138,022,580.06	*9,780,304.27*	3,516,150.34	88,416,284.28	5,902,795.99	34,587,297.73	14,286,011.00	1,094,344.99
Employees' bonus fund and special compensation to employees account stock subscriptions (including loss in sale of stock to employees)	4,777,650.78		1,528,956.50	2,550,273.33	143,762.17	251,044.95	257,535.99	46,077.84
Net earnings carried to surplus account (Exhibit 21)	133,244,929.28	*9,780,304.27*	1,987,193.84	85,866,010.95	5,759,033.82	34,336,252.78	14,028,475.01	1,048,267.15

EXHIBIT 7.—*Summary of general profit and loss account of all companies for the year 1908.*

	Grand total.	*Elimination of intercompany interest and adjustment of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$132,742,489.95	*$2,035,490.98*		$55,220,168.02	$16,675,598.26	$52,882,214.65		
To outside customers	306,091,905.07	*1,488.10*		305,185,698.62	113,519.03	794,175.52		
Gross earnings from operations of transportation and miscellaneous companies	43,486,800.16	*23,294.57*					$38,735,125.94	$4,773,968.79
Sales credited to construction	*188,984.72*				*188,984.72*			
Sales adjustments	276,841.68			276,841.68				
Gross sales and earnings	482,415,052.14	*2,059,273.65*		370,682,708.32	16,606,132.57	53,676,390.17	38,735,125.94	4,773,968.79
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	98,425,641.07	*1,638,210.65*		56,287,983.39	10,716,640.13	33,059,228.20		
To outside customers	246,110,222.98	*398,768.43*		245,608,044.56	77,384.39	823,562.46		
Operating expenses of transportation and miscellaneous companies	26,097,401.09						22,299,807.21	3,797,593.88
Cost adjustments	1,646,720.54			1,586,749.66	5,435.33	54,535.55		
Total operating charges	372,279,985.68	*2,036,979.08*		303,482,777.61	10,799,459.85	33,937,326.21	22,299,807.21	3,797,593.88
Deduct extinguishment funds and depreciation and replacement funds charged through costs (see below)	4,543,827.13			436,290.64	187,225.17	1,973,800.35	1,946,510.97	
Net operating charges	367,736,158.55	*2,036,979.08*		303,046,486.97	10,612,234.68	31,963,525.86	20,353,296.24	3,797,593.88
Administrative, selling, and general expenses	11,492,700.84		$1,023,555.03	9,313,043.19	443,880.35	593,616.30		118,605.97
Insurance not charged to mill costs	*35,700.99*			*36,918.90*	1,217.91			
Taxes—State and local	5,361,160.20		88,654.62	2,030,892.54	446,038.76	1,846,185.73	886,794.96	62,593.59
Commercial discounts and interest	2,707,181.06			2,707,181.06				
Total operating charges and general expense	387,261,499.66	*2,036,979.08*	1,112,209.65	317,060,684.86	11,503,371.70	34,403,327.89	21,240,091.20	3,978,793.44
Balance	95,153,552.48	*23,294.57*	*1,112,209.65*	53,622,023.46	5,102,760.87	19,273,062.28	17,495,034.74	795,175.35
Sundry manufacturing and operating gains and *losses* (net)	1,380,983.53	79,323.82	1,538.01	817,083.26	466,696.32	*55,989.71*	55,649.22	16,682.61
Other income	4,298,079.96	*4,199,785.71*	4,022,571.15	2,804,058.17	80,019.15	867,938.57	525,803.00	196,813.63
Total income	100,832,615.97	*4,142,694.46*	2,911,899.51	57,243,764.89	5,649,476.34	20,085,011.14	18,076,486.96	1,008,671.59
Interest charges	7,399,559.18	*4,199,785.71*	23,296.13	5,775,082.23	357,429.43	386,891.20	4,954,113.27	102,470.63
Balance	93,433,056.79	57,029.25	2,888,603.38	51,468,682.66	5,292,046.91	19,698,119.94	13,122,373.69	906,200.96

Less profits included above by subsidiary companies on account of materials in transit, not yet taken up	*109,669.84*	*109,669.84*							
Total earnings	93,323,396.85	*52,640.69*	2,888,603.38	51,468,662.66	5,202,046.91	19,098,119.94	13,122,373.69	906,200.96	
Less (set aside for depreciation and extraordinary renewals):									
Bond sinking funds	1,588,070.45			715,592.40	60,824.35		786,653.70	25,000.00	
Depreciation and extinguishment funds	1,787,054.02			*40,944.34*	1,060,382.73	277,730.29	512,336.04	7,549.30	
Improvement and extraordinary replacement fund	9,046,229.86			7,436,180.32	343,732.49	247,837.31	955,165.59	63,314.15	
Depreciation and extinguishment funds (see above)	2,057,180.19			156,984.94		1,900,175.25			
Improvement and extraordinary replacement fund (see above)	2,488,666.94			279,305.70	187,225.17	73,625.10	1,946,510.97		
Net earnings before deducting bonus funds	76,358,205.39	*52,640.69*	2,888,603.38	42,921,553.64	3,069,882.17	17,198,751.99	8,921,707.39	810,337.51	
Employees' bonus fund and special compensation to employees' account stock subscriptions	1,475,676.28		257,045.51	962,788.00	47,612.00	99,968.77	92,668.00	15,564.00	
Net earnings carried to surplus (Exhibit 21)	74,882,529.11	*52,640.69*	2,631,557.87	41,958,765.64	3,022,270.17	17,098,783.22	8,829,039.39	794,773.51	

	Grand total.	*Elimination of intercompany interest and adjustment of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$176,617,531.94	*$10,392,677.51*		$82,767,840.16	$26,614,401.86	$77,627,967.43		
To outside customers	409,598,808.49			408,712,960.25	270,577.13	615,271.11		
Gross earnings from operations of transportation and miscellaneous companies	60,663,643.84						$54,743,222.55	$5,920,421.29
Sales credited to construction	*355,027.63*				*355,027.63*			
Gross sales and earnings	646,524,956.64	*10,392,677.51*		491,480,800.41	26,529,951.36	78,243,238.54	54,743,222.55	5,920,421.29
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	130,681,820.51	*8,361,766.06*		70,961,801.40	17,320,368.76	50,761,416.41		
To outside customers	324,884,537.55	*1,724,151.06*		325,803,410.68	196,273.80	609,004.13		
Operating expenses of transportation and miscellaneous companies	32,358,618.06						27,469,019.12	4,889,598.94
Cost adjustments	1,151,163.06	1,051,331.99		*154,948.08*	*9,975.80*	264,752.95		
Total operating charges	489,076,139.18	*9,034,585.13*		396,610,264.00	17,506,668.76	51,635,173.49	27,469,019.12	4,889,598.94
Deduct extinguishment funds and **depreciation and replacement funds charged through costs** (see below)	5,658,296.97			441,312.66	305,261.58	2,730,581.65	2,181,141.08	
Net operating charges	483,417,842.21	*9,034,585.13*		396,168,951.34	17,201,407.18	48,904,591.84	25,287,878.04	4,889,598.94
Administrative, selling, and general **expenses**	12,588,356.23		1,029,357.95	10,334,558.36	495,408.55	558,973.09		170,058.28
Insurance not charged to mill costs	*27,869.20*			*27,956.30*	563.75			123.35
Taxes, State and local	7,597,871.71		90,064.55	2,405,151.66	453,184.01	3,336,063.00	1,204,581.26	108,827.23
Taxes, Federal corporation	1,106,321.68		384.03	572,051.43	63,067.39	231,214.84	228,828.56	10,775.43
Commercial discounts and interest	3,621,613.12			3,621,613.12				
Total operating charges and general expense	508,304,735.75	*9,034,585.13*	1,119,806.53	413,074,369.61	18,213,630.88	53,030,842.77	26,721,287.86	5,179,383.23
Balance	138,220,220.89	*1,358,092.38*	*1,119,806.53*	78,406,430.80	8,316,320.48	25,212,395.77	28,021,934.69	741,038.06
Sundry manufacturing and operating gains and *losses* (net)	3,241,572.89	1,322,899.88	244,004.07	454,667.87	624,307.60	506,867.62	*85,594.96*	114,400.81
Other income	3,432,616.63	*5,181,987.47*	4,706,908.96	2,290,304.06	130,072.81	579,698.97	681,798.51	225,830.79
Total income	144,894,410.41	*5,217,179.97*	3,831,106.50	81,151,422.73	9,070,700.89	26,298,962.36	28,678,138.24	1,081,259.66
Interest charges	7,886,074.18	*5,181,987.47*	48,748.22	7,002,527.26	466,903.24	383,818.39	5,065,495.65	100,478.89
Balance	137,008,336.23	*35,192.50*	3,782,358.28	74,148,895.47	8,603,707.65	25,915,143.97	23,612,642.59	980,780.77

Less profits included above by subsidiary companies on account of materials in transit not yet taken up	*2,617,396.54*	*2,617,396.54*						
Total earnings	134,390,940.69	*2,658,588.04*	3,782,358.28	74,148,895.47	8,603,707.65	25,915,143.97	23,612,642.59	980,780.77
Less (set aside for depreciation and extraordinary renewals):								
Bond sinking funds	1,724,259.65			940,384.72	90,122.21		668,752.72	25,000.00
Depreciation and extinguishment funds	3,005,712.87			5,089.44	1,737,573.16	429,955.67	804,781.28	28,313.32
Improvement and extraordinary replacement funds	13,330,044.49			11,495,161.58	348,946.64	279,475.46	1,133,126.30	73,334.51
Depreciation and extinguishment fund (see above)	2,878,654.25			180,056.88		2,698,597.37		
Improvement and extraordinary replacement fund (see above)	2,779,642.72			261,255.78	305,261.58	31,984.28	2,181,141.08	
Net earnings before deducting bonus funds	110,672,626.71	*2,658,588.04*	3,782,358.28	61,266,947.07	6,121,804.06	22,475,131.19	18,824,841.21	854,132.94
Employees' bonus fund and special compensation to employees' account stock subscriptions	2,899,526.75		1,084,563.75	1,445,856.61	78,267.00	131,476.39	136,669.00	22,674.00
Net earnings carried to surplus account (Exhibit 21)	107,773,099.96	*2,658,588.04*	2,697,794.53	59,821,090.46	6,043,537.06	22,343,654.80	18,688,152.21	831,458.94

	Grand total.	*Elimination of intercompany interest and adjustment of other accounts.*	United States Steel Corporation and Federal Steel Co.	Manufacturing companies.	Coal and coke companies.	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:								
To subsidiary companies	$185,077,192.24	*$11,498,085.13*		$81,830,338.60	$27,794,678.15	$86,945,260.62		
To outside customers	456,527,766.66			455,961,212.31	265,894.33	300,660.02		
Gross earnings from operations of transportation and miscellaneous companies	62,927,635.03						$56,311,109.70	$6,616,525.33
Gross sales and earnings	704,532,593.93	*11,498,085.13*		537,791,550.91	28,060,572.48	87,245,920.64	56,311,109.70	6,616,525.33
Operating charges:								
Manufacturing and producing cost of product sold—								
To subsidiary companies	137,742,583.92	*9,528,125.68*		71,169,746.78	19,815,260.22	56,085,702.60		
To outside companies	359,720,098.37	*1,779,954.54*		361,027,842.10	159,735.55	312,475.06		
Operating expenses of transportation and miscellaneous companies	36,386,291.93						31,065,699.43	5,320,592.50
Cost adjustment	1,200,642.18	821,358.65		392,304.25	5,710.94	*19,771.84*		1,040.18
Total operating charges	535,049,616.40	*10,286,721.37*		432,589,893.13	19,980,706.71	56,378,405.82	31,065,699.43	5,321,632.68
Deduct extinguishment funds and depreciation and replacement funds charged through costs (see below)	6,002,754.30			375,696.41	319,053.34	2,911,299.71	2,396,060.35	644.49
Net operating charges	529,046,862.10	*10,286,721.37*		432,214,196.72	19,661,653.37	53,467,106.11	28,669,639.08	5,320,988.19
Administrative, selling, and general expenses	13,800,158.06		$989,784.84	11,487,613.15	581,233.93	545,410.93		196,115.21
Insurance not charged to mill costs	*25,054.10*			*25,639.10*	585.00			
Taxes, State and local	8,078,584.64		91,689.70	2,528,122.15	587,518.06	3,455,752.26	1,275,798.61	139,703.86
Taxes, Federal corporation	1,082,852.31		626.41	676,593.57	52,299.98	129,124.35	215,491.94	8,716.06
Commercial discounts and interest	3,545,810.90			3,545,810.90				
Total operating charges and general expenses	555,529,213.91	*10,286,721.37*	1,082,100.95	450,426,697.39	20,883,290.34	57,597,393.65	30,160,929.63	5,665,523.32
Balance	149,003,380.02	*1,206,363.76*	*1,088,100.95*	87,364,853.52	7,177,282.14	29,648,526.99	26,150,180.07	951,002.01
Sundry manufacturing and operating gains and *losses* (net)	2,445,592.79	1,503,264.28	2,701.61	*10,691.04*	661,393.67	306,689.76	*27,199.89*	9,434.40
Other income	3,124,820.65	*6,239,572.96*	6,028,058.90	2,250,263.38	100,910.46	307,376.25	548,232.34	129,552.28
Total income	154,573,798.46		4,948,559.56	89,604,425.86	7,939,586.27	30,262,593.00	26,671,212.52	1,089,988.69
Interest charges	7,263,453.66	*6,239,572.96*	56,377.20	7,334,796.24	812,763.14	386,525.24	4,814,328.12	98,236.68
Balance	147,310,339.80	296,900.52	4,892,282.36	82,269,629.62	7,126,823.13	29,876,067.76	21,856,884.40	991,752.01

Less profits included above by subsidiary companies on account of materials in transit not yet taken up	*2,417,541.79*	*2,417,541.79*						
Total earnings	144,892,798.01	*2,120,641.27*	4,892,282.36	82,269,629.62	7,126,823.13	29,876,067.76	21,856,884.40	991,752.01
Less (set aside for depreciation and extraordinary renewals):								
Sinking funds on bonds of subsidiary companies	2,176,041.18			1,133,294.66	133,211.41		884,535.11	25,000.00
Extinguishment funds	2,926,286.23		456,473.65	27,078.37	1,744,444.40	336,207.54	330,365.94	31,716.33
Depreciation and replacement funds	13,668,855.19			11,951,829.59	279,500.00	138,634.31	1,133,000.00	165,891.29
Extinguishment funds (see above)	3,092,648.29			180,591.31	112.78	2,911,299.71		644.49
Depreciation and replacement funds (see above)	2,910,106.01			195,105.10	318,940.56		2,396,060.35	
Net earnings before deducting bonus funds	120,118,861.11	*2,120,641.27*	4,435,808.71	68,781,730.59	4,650,613.98	26,489,926.20	17,112,923.00	768,499.90
Employees' bonus fund and special compensation to employees' account stock subscriptions	3,380,703.31		1,186,953.31	1,745,592.34	96,758.00	159,102.00	163,392.00	28,905.66
Net earnings carried to surplus (Exhibit 21)	116,738,157.80	*2,120,641.27*	3,248,855.40	67,036,138.25	4,553,855.98	26,330,824.20	16,949,531.00	739,594.24

	1909	1910	Total.
Gross sales:			
To subsidiary companies	$82,767,840.16	$81,830,338.60	$676,195,885.09
To outside customers	408,712,960.25	455,961,212.31	3,547,537,189.21
Sales adjustments	.....	.....	*$,873,331.93*
Total gross sales	491,480,800.41	537,791,550.91	4,220,859,742.37
Operating charges:			
Manufacturing and producing			
To subsidiary companies	70,961,801.40	71,169,746.78	577,374,657.62
To outside customers	325,303,410.68	361,027,842.10	2,798,816,368.79
Cost adjustments	*154,948.08*	392,304.25	4,014,629.17
Total operating charges	396,610,264.00	432,589,893.13	3,380,205,655.58
Deduct extinguishment funds charged through costs	441,312.66	375,696.41	10,796,278.70
Net operating charges	396,168,951.34	432,214,196.72	3,369,409,376.88
Administrative, selling, and gener	10,334,558.36	11,487,613.15	77,935,474.59
Taxes, State and local	2,405,151.66	2,528,122.15	15,953,389.84
Taxes, Federal corporation	572,051.43	676,593.57	1,248,645.00
Insurance not charged through cos	*$7,956.30*	*25,639.10*	*55,581.37*
Commercial discounts and interest	3,621,613.12	3,545,810.90	26,829,581.28
Miscellaneous expense	.....	.....	148,430.66
Total operating charges and	413,074,369.61	450,426,697.39	3,491,469,376.98
Balance	78,406,430.80	87,364,853.52	729,390,365.39
Sundry manufacturing and operat	454,687.87	*10,691.04*	9,653,216.09
Other income	2,290,304.06	2,250,263.38	22,403,885.83
Total income before interest	81,151,422.73	89,604,425.86	761,447,467.31
Interest charges	7,002,527.26	7,334,796.24	42,161,189.92
Total earnings	74,148,895.47	82,269,629.62	719,286,277.39
Less (set aside for depreciation an			
Bond sinking funds	940,384.72	1,133,294.66	6,983,408.03
Depreciation, extinguishment	11,941,563.68	12,354,604.37	113,141,815.15
Total depreciation, etc	12,881,948.40	13,487,899.03	120,125,223.18
Net earnings before deducting bon	61,266,947.07	68,781,730.59	599,161,054.21
Employees' bonus fund and spec stock subscriptions	1,445,856.61	1,745,592.34	13,128,182.72
Net earnings	59,821,090.46	67,036,138.25	586,032,871.49

	Total.
5	$210,970,220.10
3	7,881,406.11
.	678,454.56
.	225,104.60
3	218,306,308.25
2	138,711,835.16
5	4,374,583.65
4	8,354.54
1	143,094,773.
4	2,028,987.46
7	141,065,785.89
3	4,061,813.07
5	3,205,691.52
3	115,367.37
0	270,837.24
4	148,739,495.09
4	69,658,813.16
7	5,406,998.10
6	2,410,406.44
7	77,476,217.70
8	3,753,599.85
3	73,722,617.85
1	583,686.49
4	20,327,054.91
5	20,910,741.40
8	52,811,876.45
0	773,524.57
8	52,038,351.88

0	Total.
C	
260.62	$571,645,530.58
660.02	14,212,886.75
920.64	585,858,417.33
C	
702.60	387,362,476.83
175.06	13,655,496.21
771.84	299,516.66
405.82	401,317,479.70
299.71	19,927,081.12
106.11	381,390,398.58
A410.93	5,030,641.05
T752.26	14,796,197.61
T124.35	360,339.19
D.....	5,688.37
C.....	30,380.63
M.....	746,195.48
M.....	187,547.20
393.65	402,556,388.11
R526.99	183,302,029.22
689.76	4,527,488.02
C376.25	9,154,618.50
593.00	196,984,175.74
R525.24	3,760,960.36
067.76	193,223,175.38
L141.56	27,818,733.29
141.56	27,818,733.29
926.20	165,404,442.09
M	
M102.00	1,280,198.12
824.20	164,124,243.97

	1908	1909	1910	Total.
ross earnings from operations	35,125.94	$54,743,222.55	$56,311,109.70	$389,420,644.51
Deduct operating expenses	99,807.21	27,469,019.12	31,065,699.43	208,458,286.75
Less extinguishment funds and depre charged in operating expenses	46,510.97	2,181,141.08	2,396,060.35	15,943,147.62
Net operating expenses	53,296.24	25,287,878.04	28,669,639.08	192,515,139.13
Administrative, selling, and general expen				
Taxes, State and local	86,794.96	1,204,581.26	1,275,798.61	7,764,166.56
Taxes, Federal		228,828.56	215,491.94	444,320.50
Commercial discounts and interest				*9,678.98*
Rentals				904,766.30
Miscellaneous				64,070.56
Total operating charges and general	40,091.20	26,721,287.86	30,160,929.63	201,682,884.13
Balance	95,034.74	28,021,934.69	26,150,180.07	187,737,760.38
Sundry manufacturing and operating gain	55,649.22	*25,594.96*	*27,199.89*	*62,297.07*
Other income	25,803.00	681,796.51	548,232.34	3,662,271.60
Total income before interest charges	76,486.96	28,678,138.24	26,671,212.52	191,337,734.91
Interest charges	54,113.27	5,065,495.65	4,814,328.12	44,322,962.38
Total earnings	22,373.69	23,612,642.59	21,856,884.40	147,014,772.53
Less (set aside for depreciation and extraor				
Bond sinking fund	86,653.70	668,752.72	884,535.11	7,208,711.09
Depreciation, extinguishment fund, et	14,012.60	4,119,048.66	3,859,426.29	32,185,249.03
Total depreciation, etc	00,666.30	4,787,801.38	4,743,961.40	39,393,960.12
Net earnings before deducting bonus funds	21,707.39	18,824,841.21	17,112,923.00	107,620,812.41
Employees' bonus fund and special compen	92,698.00	136,689.00	163,392.00	1,387,450.13
Net earnings	29,009.39	18,688,152.21	16,949,531.00	106,233,362.28

	Total.
Gro[illegible]25.33	$49,949,194.95
[illegible]82.68	37,409,175.66
[illegible]44.49	644.49
[illegible]38.19	37,408,531.17
Adv[illegible]5.21	606,975.47
Tax[illegible]3.86	583,657.49
Tax[illegible]6.06	19,491.49
Ins[illegible]	123.35
Com	2,951.34
Mis[illegible]	*10,989.26*
[illegible]23.32	38,615,741.05
Sun[illegible]22.01	11,333,453.90
Oth[illegible]34.40	156,619.90
[illegible]22.28	2,098,146.59
Inte[illegible]38.69	13,588,220.39
[illegible]16.68	414,491.03
[illegible]2.01	13,173,729.36
Les[illegible]	
[illegible]90.00	89,583.33
[illegible]12.11	2,819,248.20
[illegible]2.11	2,908,831.53
Net [illegible]	
Em[illegible]9.90	10,264,897.83
[illegible]5.66	215,168.97
[illegible]4.24	10,049,728.86

	Total.
Gr	
.....	.....
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Op	.....
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De	.....
q	.....
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Ad 4. 84	$9,836,426.75
Tax 9. 70	819,693.15
Tax 5. 41	1,010.44
Ins	.....
Cor	.....
Ex	.....
Mi	591,457.93
). 95	11,248,588.27
Bal). 95	*11,248,588.27*
Sur . 61	420,702.74
Oth 8. 90	29,360,356.62
). 56	18,532,471.09
Int . 20	1,170,089.97
2. 36	17,362,381.12
Le 4. 65	456,473.65
4. 71	16,905,907.47
Em	
s 4. 31	7,885,554.32
5. 40	9,020,353.15

	Iron mining companies.	Transportation companies.	Miscellaneous companies.
Gross sales and earnings:			
To subsidiary companies	$571,645,530.58		
To outside customers	14,212,886.75		
Gross earnings of transportation and mi		$389,420,644.51	$49,949,194.95
Sales credited to construction			
Sales adjustments			
Total gross sales and earnings	585,858,417.33	389,420,644.51	49,949,194.95
Operating charges:			
Manufacturing and producing cost of pr			
To subsidiary companies	387,362,476.83		
To outside customers	13,655,486.21		
Operating expenses of transportation an		208,458,286.75	37,409,175.66
Cost adjustments	299,516.66		
Total operating charges	401,317,479.70	208,458,286.75	37,409,175.66
Deduct extinguishment funds and depre charged through costs	19,927,081.12	15,943,147.02	644.49
Net operating charges	381,390,398.58	192,515,139.13	37,408,531.17
Administrative, selling, and general expense	5,030,641.05		606,975.47
Taxes, State and local	14,796,197.61	7,764,166.56	588,657.49
Taxes, Federal corporation	360,339.19	444,320.50	19,491.49
Insurance not charged through costs	5,688.37		123.35
Commercial discounts and interest	39,380.63	*9,578.92*	2,951.34
Exploration expenses of properties abandon	743,196.48		
Rentals		904,766.30	
Miscellaneous expenses	187,547.20	64,070.56	*10,989.26*
Total operating charges and general ex	402,556,388.11	201,682,884.13	38,615,741.05
Balance	183,302,029.22	187,737,760.38	11,333,453.90
Sundry manufacturing and operating gains s	4,527,488.02	*62,297.07*	156,619.90
Other income	9,154,618.50	3,662,271.60	2,098,146.59
Total income, before interest charges	196,984,135.74	191,337,734.91	13,588,220.39
Interest charges	3,760,960.36	44,322,962.38	414,491.03
Balance	193,223,175.38	147,014,772.53	13,173,729.36
Less profits included above by subsidiary c rials in transit not yet taken up			
Total earnings	193,223,175.38	147,014,772.53	13,173,729.36
Less set aside for depreciation and extraordi	27,818,733.29	39,393,960.12	2,908,831.53
Net earnings before deducting bonus f	165,404,442.09	107,620,812.41	10,264,897.83
Employees' bonus fund and special compen subscriptions	1,280,198.12	1,387,450.13	215,168.97
Net earnings	164,124,243.97	106,233,362.28	10,049,728.86

[1] *Includ* *78,582.34.* *(See Exhibit 24.)*

9	1910
Depr 46.32	$207,669.68
Impr 61.58	11,951,829.59
Depr cos 255.78	195,105.10
Speci	.....
5 3.68	12,354,604.37
Bond 884.72	1,133,294.66
948.40	13,487,899.03
Depr 873.16	1,744,557.18
Impr 48.64	279,500.00
Depr cos 1.58	318,940.56
Speci	.....
781.38	2,342,997.74
Bond 22.21	133,211.41
903.59	2,476,209.15
Depr 55.67	331,207.54
Impr 75.46	138,634.31
Depr cos 81.65	2,911,299.71
Speci	.....
212.78	3,386,141.56
Bond	.....
212.78	3,386,141.56
Depr 81.28	330,365.94
Impr 26.30	1,133,000.00
Depr cos 41.08	2,396,060.35
Speci	.....
148.66	3,859,426.29
Bond 52.72	884,535.11
201.38	4,743,961.40
Depr 13.32	32,360.82
Impr 34.51	165,891.29
47.83	198,252.11
Bond 00.00	25,000.00
47.83	223,252.11
13.98	24,317,463.25
Depr 69.75	2,651,161.16
Impr 44.49	13,668,855.19
Depr cos 40.09	5,821,405.72
Speci	.....
154.33	22,141,422.07
Bond 59.65	2,176,041.18
13.98	24,317,463.25
Extr	456,473.65
13.98	24,773,936.90

Administ		
Losses on	$1,071,757.27	$11,974,751.93
Special c	223,293.21	855,406.83
subscri		
Bonus ful	680,703.31	4,564,542.67
Subsidiar	506,250.00	3,253,837.00
by Uni		
Deficit in	.....	16,530.62
assume		
Reserve f	.....	9,298.77
Bridge		
Depreciat	.....	750,000.00
Interest o	245,250.44	1,957,186.71
Interest o	258,117.52	2,336,674.84
Interest o	29,032.99	1,171,916.22
Interest o	.....	22,000.00
Interest o	24,000.00	66,000.00
fund...		
Interest g	4,971.32	4,971.32
4 per ce		
Interest g	41,330.66	181,517.58
first-mo		
Interest o	1,999,500.00	9,332,412.51
cent gol		
Interest o	15,197,850.00	148,159,537.49
5 per ce		
Provision	10,000,000.00	67,957,389.13
for addi		
Sinking fu	.....	49,500,000.00
5 per ce		
Sinking fu	3,040,000.00	29,133,333.33
year 5 p		
Compensa	1,010,000.00	7,827,500.00
tion 10,		
under co	.....	6,800,000.00
Dividends	25,415,125.00	124,511,660.50
Dividends	25,219,677.00	269,414,628.66
	84,966,858.72	739,801,096.11
Net profits	10,527,185.95	61,568,384.97
	95,494,044.67	801,369,481.08

ited States Steel Corporation—Surp			
10.			
31. Losses to date brought from Ex			$25,000,000.00
04.			
. 31. Surplus invested in and written			61,568,384.97
H. C. Frick Coke Co., general ac			
Federal Steel Co., general accou			
National Tube Co., general acco			
Shelby Steel Tube Co., general			
American Bridge Co., New Jers			
906.			
1. 31. Provision for contemplated ap			
construction			
Surplus invested in and written			
1909.			
ec. 31. Appropriated surplus for investr			
Balance—United States Steel Cc			
			86,568,384.97
1910.			
ec. 31. Surplus account charges and adj	urplus		55,886,295.56
Elgin, Joliet & Eastern R.			
counts receivable		$21,328,859.52	
Material in transit, adjustm		2,040,267.03	
Duluth & Iron Range adjus		17,347,799.73	
Northern Ry		3,473,027.97	
Bunsen Coal Co., powder in		80,350.01	
Bunsen Coal Co., inventory		35,447,001.33	
Universal Portland Cement		20,692,088.64	
Universal Portland Cement		1,987,764.45	
Illinois Steel Co., shortage i		441,317.18	
American Sheet & Tin Plat		1,739,642.13	
No. 2112		2,251,713.51	
Duluth, Missabe & Norther		22,541,442.23	
Appropriation from surplus		126,798.39	
Special appropriation accou		898,086.47	
Reserve account advanced		4,088,381.99	
			134,484,550.58
Balance down			
			190,370,846.14
	account	33,704,439.32	
		130,438,718.67	
			164,143,157.99

00.00	
00.00	
	$868, 583, 600.00
.....	620, 352. 50
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561.51	
Le 705.19	
	596, 351, 866. 70
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792.38	
Co 00.00	
Ins	3, 097, 792. 38
Le 264.04	
500.00	
d 122.16	
827.16	
373.15	
ren 919.25	
Inv 781.25	
Acc	52, 834, 787. 01
Bill	
Ag	1, 521, 498, 396. 59
Sur	
Ca 728.70	
je 99.21	
	20, 092, 727. 91
189.22	
310.78	
	40, 000, 000. 00
000.00	
718.67	
718.67	
439.32	
	164, 143, 157. 99
	1, 745, 724, 284. 49

uatiese profits. The total

	Total.
E. 75	.....
S....	$25,000,000.00
N....	74,960,704.21
M. 80	905,039,607.77
A. 79	22,681,556.87
S. 29	651,079.20
2. 63	1,028,332,948.05
I. 64	142,436,872.05
S. 89	66,334,782.75
S. 00	29,133,333.33
D. 00	7,827,500.00
S. 47	7,333,759.32
). 00	*253,066,247.45*
I. 00	269,414,628.66
S. 00	124,512,257.50
2. 00	*393,926,886.16*
C....	6,800,000.00
S. 00	131,027,364.16
H. 00	65,000,000.00
C. 00	7,000,000.00
E. 64	7,369,292.29
7. 99	164,143,157.99
2. 63	1,028,332,948.05

Dec. 31, 1910.

Capital surplus provided at date of organizat			$25,000,000.00
Net earnings from Apr. 1 to Dec. 31, 1901	$74,960,704.21		
Net earnings from Jan. 1, 1902, to Dec. 31, 19	905,039,607.77		
Total net earnings for the period		$980,000,311.98	
Less interest and sinking funds on United S		253,066,247.45	
Balance after deducting interest on bo		726,934,064.53	
Less:			
Amount included therein representing	10,371,803.25		
Net charges against profits made at clos	7,369,292.29		
Reserved for fund to cover possible failu	7,000,000.00		
		24,741,095.54	702,192,968.99
Balance of profits earned			727,192,968.99
Dividends paid on United States Steel Corp			
Preferred, 6⅞ per cent		269,414,628.66	
Common, 24½ per cent		124,512,257.50	
			393,926,886.16
Leaving a surplus of			333,266,082.83
Of the foregoing surplus the following amou			
For payment of capital liabilities, const		137,827,364.16	
Specifically set aside for authorized app		65,000,000.00	
			202,827,364.16
Balance of surplus Dec. 31, 1910, excl			130,438,718.67
Undivided surplus of subsidiary companies as is:			
Transfer from general surplus account D		10,371,803.25	
Transferred per Exhibit 21	22,681,556.87		
Additional adjustments on intercompan	651,079.20		
		23,332,636.07	
			33,704,439.32
Total undivided surplus Dec. 31, 1910			164,143,157.99

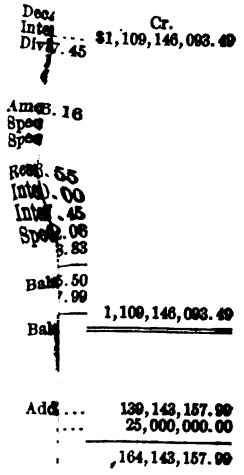
	Net total.
1[illegible] ..	$1,420,537,993.90
..	116,356,111.41
..	1,304,181,882.49
1[illegible] ..	16,966,868.63
1[illegible]3	4,128,832.31
..	30,280,632.07
1[illegible]0	1,846,253.38
[illegible]6	5,813,016.38
1[illegible] ..	10,759,560.42
1[illegible]3	6,063,986.57
1[illegible]0	3,876,913.43
1[illegible]9	11,983,409.12
[illegible]9	28,305,204.30
[illegible]	
1[illegible] ..	49,946,095.57
1[illegible]1	25,949,479.96
1	47,792,246.60
L2	1,547,884,381.23
..	117,671,520.47
..	1,430,212,860.76

	40	Total.
Manu	463.10	$175,119,745.53
Coal	665.74	13,674,743.06
Iron-	723.29	4,054,497.12
Trans	089.30	57,852,224.38
Misce	967.89	1,477,372.25
	899.32	252,178,582.34

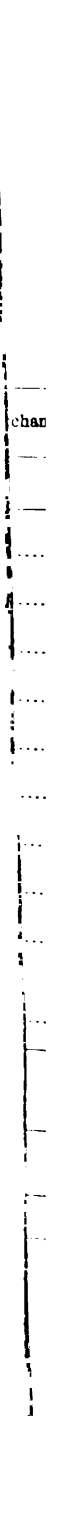
0.

ings.

Year.	Employees' bonus funds, etc.	Interest on bonds, mortgages, and purchase-money obligations of subsidiary companies.	Total adjusted net earnings.
1901		$3,963,871.49	$79,460,704.21
1902	$2,321,313.63	6,114,561.20	116,386,426.67
1903	1,965,792.74	6,539,847.45	96,009,958.24
1904	1,631,565.76	6,559,154.21	66,323,805.39
1905	2,301,838.88	6,687,104.16	113,319,474.48
1906	3,925,010.70	6,535,211.11	140,980,125.99
1907	4,777,650.78	6,492,195.42	155,555,713.50
1908	1,475,676.28	7,401,205.18	86,168,499.46
1909	2,899,526.75	7,887,178.18	123,449,905.16
1910	3,380,703.31	7,263,453.66	131,491,480.39
	24,670,078.83	65,443,782.06	1,109,146,093.49



	Cr.
Dec...	
Inte...	
Div... 7.45	$1,109,146,093.49
Amo... 8.16	
Spec...	
Spec...	
Rea... 8.55	
Int... 0.00	
Int... .45	
Spe... 2.06	
8.83	
Bal... 6.50	
7.99	
Bal...	1,109,146,093.49
Add...	139,143,157.99
...	25,000,000.00
	164,143,157.99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change.

	Total.
	$492,006,160.00
	110,415,546.00
	103,432,991.00
	98,147,685.00
	73,702,500.00
	63,499,000.00
	32,992,500.00
	48,996,500.00
	66,976,520.00
	79,417,542.00
	18,500,000.00
	3,795,588.00
	1,191,882,532.00
	129,947,605.00
	3,000.00
	1,321,883,137.00
	59,091,657.00
	21,872,023.00
	1,402,846,817.00

The following are extracts from my reports to the committee of July 18, August 2, and December 4, 1911, as far as such reports are important to present a complete printed record of my proceedings:

[Telephone, 5510 John. Cable address "Seaforth." Firm of Farquhar J. MacRae, certified public accountants.]

68 WILLIAM STREET, NEW YORK,
July 18, 1911.

Hon. A. O. STANLEY,
Chairman United States Steel
Corporation Investigation Committee,
House of Representatives, Washington, D. C.

DEAR SIR: Referring to the resolution of your committee telegraphed to me this day as follows:

Resolved, That the clerk of this committee be instructed to direct Mr. F. J. MacRae to furnish at once to this committee copies of all requests for information or for documents of any sort containing information he has been refused by the United States Steel Corporation; also the original letters, memoranda or other documents in which the United States Steel Corporation or its accredited representatives refused to furnish the information or documents requested,

I have the honor to report as follows:

Under the instructions of your committee, I have requested the United States Steel Corporation or its accredited representatives to furnish me with the following books, documents, or papers:

No. 1. Minutes of directors and of the finance committee, and from time to time any documents that may be referred to therein.

The minutes of the directors and finance committee were placed at my disposal and I read the same, and under my direction certain extracts and memoranda were copied therefrom and the same are presented herewith for the information of the committee and are marked: "Minutes of directors and minutes of finance committee, as extracted"; and indexes of these minutes are also furnished.

It is the intention to make a further investigation of these minutes in order to provide fuller extracts as to matters considered important, as it was not feasible to make a complete record covering the 10 years history of the corporation within the first few days, when only a general survey and indexes of subjects examined were prepared.

No. 2. Journal and ledger containing opening entries on the formation of the United States Steel Corporation.

The journal and ledger containing the opening entries on the formation of the corporation were placed at my disposal.

Document No. 2 is a trial balance of the ledger of the corporation as a holding company, showing the assets and the liabilities, the surplus and the capitalization of that company on December 31, 1903, at which time the balances were transferred to a new ledger. This statement shows the number of shares of stock of the subsidiary companies and the bonds of the Carnegie Co., which were deposited in trust with the United States Trust Co., as trustee, and as against which were issued the stock and bonds of the United States Steel Corporation, and this statement also shows the shares of stock of subsidiary companies owned by the corporation.

The book value carried on the books of the corporation of the shares of stock of subsidiary companies (including the stock of the Shelby Steel Co., and the Carnegie Co., bonds) amounted to the sum of

$1,323,631,614.20 at the date of this statement, which was made up in the following manner:

Common stock.

Original issue	$1,500.00
Morgan Syndicate	506,274,300.00
Issued for Shelby Tube Co	2,026,700.00
	508,302,500.00

Preferred stock.

Original issue	1,500.00
Morgan Syndicate	508,443,600.00
Issued for Shelby Tube Co	1,836,000.00
	510,281,100.00
Issue of 50-year, 5 per cent gold bonds	303,917,000.00
Organization expenses charged to cost of stocks acquired	1,041,395.24
Sundry cash payments, etc	89,618.96
Total cost of all stocks and bonds of subsidiary companies, deposited with the United States Trust Co., as trustee, or owned, as shown by ledger of the United States Steel Corporation, Dec. 31, 1903	1,323,631,614.20

No. 3. Copies of annual reports of United States Steel Corporation since formation.

These reports were furnished to me and are now in my possession.

No. 4. Annual reports for each year for subsidiary companies.

In this connection it was stated to me that there were no reports of the subsidiary companies printed, and I have not received any printed reports of the subsidiary companies; but I stated to the auditor of the corporation, Mr. Filbert, that in order for them to make up their annual balance sheet as printed, it is necessary for them and the auditors of the corporation, Messrs. Price, Waterhouse & Co., to have such statements; and that I wanted to see the same and on the afternoon of the 17th of July, 1911, Mr. Filbert brought to me, for my inspection, the working sheets O. K.'d by Messrs. Price, Waterhouse & Co., showing the assets and the liabilities of the separate subsidiary companies of the United States Steel Corporation and various underlying companies. I then requested him to furnish me, in addition to the last-mentioned statements, the trading and profit and loss accounts of each of the several companies referred to above, showing the sales and expenses and the surplus earnings which should be attached to the balance sheets referred to above. I was asked what was my purpose in requesting these documents; I answered that I desired the documents for the information of the Stanley committee. I was then asked if I intended to make copies of these documents. I said that it was my purpose to make copies of the documents. Mr. Filbert thought that in the absence of the counsel for the company, Mr. Lindabury and Mr. MacVeagh, that he did not know but that he was exceeding his duties if he allowed me to go on along these lines.

On the 18th of July, in the afternoon, Messrs. MacVeagh and Lindabury consented that I should make copies of these documents. These documents are very voluminous. * * *

I asked Messrs. MacVeagh and Lindabury, if, in order to shorten the work, to save expense to the Government, and to save my time and save themselves trouble they would allow me to have the docu-

ments photographed, and that they might select their own photographer and send the bill to me, and have the plates destroyed after one copy had been made. Mr. MacVeagh did not like the idea of having the documents photographed, and I then stated that, with the consent of your committee, I would have these documents copied. The documents contained important information regarding the subsidiary companies, which can not be obtained from the published annual reports of the corporation nor from any report of the Bureau of Corporations.

No. 5. List of investments, including stocks of subsidiary companies, as at the last balance sheet December 31, 1910.

This information is being compiled by the auditing department of the United States Steel Corporation, but has not yet been received by me.

(A) Copy of contract with J. P. Morgan & Co., referred to at directors' meeting March 1, 1901.

This document was handed to me and is attached hereto and marked "Document No. 1."

(B) Copy of contract with J. P. Morgan & Co. referred to at directors' meeting of April 1, 1909.

This document has been handed to me and is attached hereto and marked "Document No. 2."

(C) Copy of report of special committee on Norfolk & Western Coal & Coke Co., and Pocahontas Coal & Coke Co., submitted by Mr. Widener at the seventeenth meeting of the directors January 7, 1902.

The original document on file in the office of the company was exhibited to me, but no copy was furnished. If a copy is desired, the same will be obtained. * * *

(D) Contract with J. P. Morgan & Co. relating to conversion of preferred stock into bonds, at the nineteenth meeting of the directors and again referred to in report of the finance committee meeting of April 1, 1902.

A copy of this document was delivered to me and is attached hereto and marked "Document No. 4."

In this connection I wish to state that the books of the United States Steel Corporation show that the commission charged for this transaction was $6,800,000.

(E) Statement embodying certain statistics relating to mining, manufacturing, and transportation of the subsidiary companies for the year ending March 31, 1902.

A copy of this document was delivered to me and is hereto annexed and marked "Document No. 5."

(F) Report of the presiding officer at the nineteenth meeting of the directors October 7, 1902.

A copy of this document was submitted to me and certain abstracts therefrom were made, omitting certain figures relating to costs. (See document No. 6.)

(G) Agreement with the Pittsburg Coal Co. by the executive committee, dated April 20, 1905.

A copy of this document was furnished to me. (See document No. 7.)

(H) Contract referring to Clairton deal referred to at directors' meeting October 3, 1905.

The document marked "No. 8" was furnished in response to this request, but it is not the document desired; the one wanted being referred to in subsequent meetings, and it was finally produced to Mr. Stanley at the office of the United States Steel Corporation.

(I) Contract dated January 2, 1907, between Wenona Iron Co., Hill, et al., and Great Northern Iron Co.

This is the so-called Hill ore lease. It is a large printed volume. The corporation reported that they had only the signed original copy, which will be produced to the committee for inspection when wanted. (See corporation's typewritten statement hereto annexed.)

(J) Contract of April 1, 1901, with J. P. Morgan & Co., regarding acquisition of American Bridge Co., Lake Superior Consolidated Iron Mines, Bessemer Steamship Co., Oliver Iron Mining Co., and Pittsburg Steamship Co.

This is said by the United States Steel Corporation to be a duplication of the document No. 2, furnished in response to request marked "(B)."

(K) Contract with Union-Sharon Co. December, 1902.

This document was furnished me and is hereto attached, marked "Document K."

(L) Minutes of the executive committee.

These minutes were requested by me, and I am informed by Mr. Stanley they were not in evidence before the committee at Washington.

The record of these minutes consists of one book only and ends with the meeting of June 9, 1903. An abstract taken from these minutes is submitted herewith and marked "Minutes of executive committee as extracted."

(M) Compensation of J. P. Morgan & Co. as to original promotion and acquiring original subsidiary companies.

The amount of profit or compensation of the firm of J. P. Morgan & Co. or the syndicate interested in the promotion of the United States Steel Corporation can not be obtained from the books of the United States Steel Corporation. It is nowhere therein stated. The exact figures could only be obtained either from J. P. Morgan & Co. or the syndicate interested in the formation of the Steel Corporation. But in document (P) there is a reference to it, and from the information obtained therefrom and from the officers of the corporation it would appear that the compensation or profit, so far as known, was, roundly, $130,000,000, half in preferred stock of the United States Steel Corporation and half in common stock of the United States Steel Corporation

Assuming that the value of the preferred stock was par, we would get $65,000,000, and assuming that the average price of the common stock was, say, 40, we would have $26,000,000, making in all $91,000,000.

Deducting from this amount the sum contributed to the United States Steel Corporation as cash surplus, viz, $25,000,000, and also the sum, stated to be $3,000,000, which was paid for the necessary expense of the formation of the United States Steel Corporation, we would have $91,000,000 less $28,000,000, with $63,000,000 remaining as the compensation of J. P. Morgan & Co.

Document P, subsequently referred to, states that there remained a sum of money, which, together with the unsold balance of such

remainder of preferred stock and common stock, will amount approximately to $56,000,000, and will constitute a profit realized by the syndicate and subject to distribution among the syndicate managers and the syndicate subscribers.

(N) Letter from Mr. J. A. Farrell, export sales agent of the American Steel & Wire Co., to Mr. Corey, dated July 27, 1903, referred to at finance committee meeting July 28, 1903, referring to export bureau or foreign sales department.

It was reported to me that a search was being made for this letter, but up to this date the corporation has been unable to find it.

(O) Letter from President Lynch to President Corey October 20, 1903, in reference to Pocahontas coke matter.

I read this letter, which is an original document and relates to coke ovens and the Pocahontas field. I will furnish a copy of it if it is desired.

(P) Contract of March 1, 1902, with J. P. Morgan & Co., regarding compensation for acquiring stock of subsidiary companies.

A copy of this document was furnised to me, and is hereto attached, marked "Document P," and it is also referred to above under heading (M).

(Q) Letter from President Lynch referred to in the minutes of the finance committee November 22, 1904, in reference to shortage of coke and recommending purchases of 100,000 tons of Pocahontas coke.

It was reported to me that a search was being made for this letter, but up to this date the corporation has been unable to find same.

(R) Reports made by president from time to time to the finance committee with reference to the export department, foreign sales, etc.

NOTE.—With respect to document R, Mr. MacRae asked for prices at which sold, and Mr. Filbert stated he had agreed to furnish the committee with figures which he believed would answer the purpose and be much more satisfactory than to pick out prices for the bookings for one week.

In relation to this request, see document R.

In this connection, Mr. Stanley requested the price c. i. f. at destination. Is was stated that this would be furnished.

(S) Letter from J. A. Farrell in reference to importation of iron and steel referred to in the minutes of finance committee April 11, 1905, referring to the subject of importations of iron and steel in 1902 and 1903, and suggesting a plan by which the company might keep in touch with future sales of imported iron and steel in this country.

It was reported to me that a search was being made for this letter, but the corporation has been unable to find the same.

(T) List of plants and properties acquired by the United States Steel Corporation or its subsidiary or constituent companies on its incorporation or by purchase since, which have been sold, dismantled, or otherwise disposed of.

This list is being prepared by the auditing department, but has not yet been furnished.

(U) List of investments held by subsidiary or constituent companies as shown by last balance sheet.

I am informed that the auditing department is preparing this list, but it has not yet furnished the same to me.

(V) Schedule of profits of the principal products of the organization at present prices, submitted at the meeting of the finance committee April 27, 1909.

I have not received this document, and it is withheld for the time being. Mr. Stanley and Messrs. Lindabury and MacVeagh had a discussion in relation to this and other documents requested by me into which the question of costs and profits entered.

(W) Report of comptroller showing additional blast furnaces acquired by purchase annually since organization and submitted by the secretary at meeting of October 5, 1909.

This document was submitted, and is hereto annexed and marked "Document W."

(X) Letter of President Farrell dated April 5, 1909, in reference to plant in Canada for manufacturing the corporation's products.

See memorandum marked "X."

This document was withheld temporarily, but Mr. Stanley saw it while in New York, and took copies therefrom.

(Y) Letter to Mr. Kerr from President McGonagle, of the Duluth, Missabe & Northern Railway Co., dated December 22, 1909, in reference to ore shipment from Cuyuna Range referred to at finance committee meeting December 28, 1909.

This document was furnished to me, and is hereto annexed marked "Document Y."

(Z) Letter of Mr. Kerr to the president dated December 14, 1909, in reference to Michigan Iron & Land Co. lands referred to at finance committee meeting December 28, 1909.

This document was furnished to me, and is hereto annexed and marked "Document Z."

(AA) Contract between American Steel & Wire Co. and the Monongahela River Coal & Coke Co., referrred to at finance committee meeting March 13, 1910.

There was only one original copy of this contract on file, which will be furnished to the committee if requested. I believe that Mr. Stanley saw this original.

(BB) Opinion of Messrs. MacVeagh, Reed, Severance, Kellogg, and Knapp, relating to terminal allowances.

This document was not furnished, and the request was referred to Messrs. Lindabury and MacVeagh to pass upon. I believe that they claim it was a privileged communication between attorney and client. Mr. Stanley had a conversation with Mr. Lindabury in regard to this matter.

(CC) Any reports of or concerning the Tennessee Coal, Iron & Railroad Co., showing amount of coal, iron, manganese, timber, and other minerals or materials in sight.

I am informed that the auditing department is preparing this information, but has not yet furnished it to me.

(DD) Amount of stock of Tennessee Coal, Iron & Railroad Co. owned by the United States Steel Corporation or held in trust for them prior to the absorption of the Tennessee Coal, Iron & Railroad Co.

The answer to this inquiry, made by the United States Steel Corporation, is "None." (See typewritten memorandum marked "DD.") But see Chairman Gary's testimony before the Stanley committee, page 127, concerning loan made by United States Steel Corporation with Tennessee Coal, Iron & Railroad Co.'s stock as collateral.

On October 23, 1907, according to the minutes of the finance committee, it was unanimously voted that an exchange of $1,200,000

par value ten-sixty 5 per cent gold bonds of the United States Steel Corporation be made for 20,000 shares, $2,000,000 par value, Tennessee Coal, Iron & Railroad Co., as outlined in the agreement submitted. There was evidently no entry made of this transaction upon the financial books of the company.

A copy of the agreement last mentioned has been asked for and has not yet been received, and is referred to later under the heading (TT).

(EE) Recommendation of Judge Gary and special committee as to sale of semifinished products at finance committee April 5, 1904, requested reports, letters, or any other data referring to this matter. This was a noncompetitive recommendation.

The corporation replied to this request as follows:

So far as we know there are no data or papers or information on file relating to this matter beyond that contained in the minutes of the finance committee meeting. See typewritten memorandum (EE).

(FF) What arrangement, if any, was made by Messrs. Gary and Corey with foreign producers with regard to the price of rails to be sold in neutral markets as shown in finance committee minutes November 1, 1904?

The corporation replied to this request as follows:

The answer is none so far as our records show or as I know. W. J. F.

(GG) Wabash Union Railroad Co. contract referred to at finance committee meeting December 6, 1904.

A copy of this contract was furnished marked "GG" with a note that the contract was made before the United States Steel Corporation was organized.

(HH) Contract between Carnegie Steel Co. and Pittsburg Steel Co. for supply of billets referred to at finance committee meeting April 11, 1905:

This document has not yet been furnished me.

(II) Contract between American Sheet & Tin Plate Co. and the American Can Co. referred to at finance committee meeting April 11, 1905.

It was reported to me that a search was being made for this document, but it has not yet been delivered to me.

(JJ) President's reports of plants and operations.

A sample document was furnished and marked "JJ."

(KK) Letter of James M. Swank referred to at finance committee meeting January 17, 1911.

This letter was submitted to Mr. Stanley.

(LL) Proposition and proposed arrangement between United States Steel Corporation and Crucible Steel Co. referred to in finance committee minutes March 19, 1903. The corporation replied to this request as follows:

So far as we know or are able to ascertain, there was no written proposition covering the negotiations referred to. No arrangement or agreement was ever consummated on the basis of the proposition then being negotiated for, as referred to in the minutes. (See typewritten memorandum marked "LL.")

NOTE.—This is a sliding-scale agreement, and Mr. Stanley, when in New York, discussed this matter with the United States Steel Corporation attorneys and officials. In this connection, I have requested the steel company to furnish me from the sales records of the Clairton Steel Co. the statement of the sales to the Crucible Steel Co. and outsiders, showing the difference in price of materials sold to the Crucible Steel Co. and others. I have not yet received this statement, which is referred to in the

minutes of the finance committee of March 19, 1903, in part as follows: "That accompanying the proposition is a proposed arrangement between this company and the Crucible Steel Co. for the total requirements of iron and steel for the Curcible Steel Co. when and as the United States Steel Corporation is in a position to furnish the same." (See typewritten memorandum marked "LL.")

(MM) Dividends declared by the subsidiary or constituent companies of the United States Steel Corporation since incorporation of the last-named company.

I took this data from the books of the company, and it is shown in statements submitted herewith marked "MM," which are abstracts of the profit and loss account of the United States Steel Corporation, which practically exhibits the income of the corporation since its formation and down to December 31, 1910, and all its expenses and other charges as a holding company.

(NN) Agreement between Pocahontas Coal & Coke Co. and the Norfolk & Western Railroad Co., referred to in the minutes of January 3, 1902, of the finance committee.

This is a voluminous printed document, and the corporation has a filing copy only, which was shown to Mr. Stanley.

(OO) Letter of July 27, 1903, to Mr. Corey from J. A. Farrell, referred to at finance committee meeting July 28, 1903, in reference to export bureau or foreign sales department.

This letter has not been found up to this date, but I am informed that a search is being made for it.

(PP) Referring to the printed report of the United States Steel Corporation of December 31, 1910, the gross sales as stated are $703,961,424.

I requested them to analyze this amount and furnish me with a statement showing how much of these sales were sold to customers outside of the United States Steel Corporation organization, as the sales so stated of $703,961,424 included sales between subsidiary companies of the United States Steel Corporation and was misleading in calculating the percentage of profit of turning over the goods sold. This document is furnished and submitted herewith and marked "PP."

(QQ) Marketable securities bought and sold by the United States Steel Corporation. Large quantities of preferred and common stock, bonds, and other securities included in the general ledger under this heading.

I have prepared a statement from the books of the corporation, showing these transactions marked "QQ," submitted herewith.

The corporation makes the statement that practically all the common and preferred stock was for account of the employees' stock subscription. A copy of the employees' stock subscription agreement is submitted in connection with this schedule and marked "WW."

(RR) Surplus stated in the report of the United States Steel Corporation December 31, 1910, amounts in round numbers to about $164,000,000. The surplus on the books of the United States Steel Corporation, as a holding company, amounts at this date to about $45,000,000. It is impossible from the books of the United States Steel Corporation to reconcile the difference between these two amounts, it being necessary to have the reports of the subsidiary companies which would be covered in the documents referred to in request No. 4.

(SS) Referred to under request marked "LL." I requested them to furnish me a memorandum showing the difference in prices charged by the Clairton Co. to the Crucible Steel Co. and to outsiders. Sales agreement furnished and marked "SS." I am informed that they are preparing a further statement.

(TT) Duplicate request regarding $2,000,000 transaction in Tennessee Coal, Iron & Railroad Co. stock referred to above.

(UU) Request for comparative statement of cost per ton to produce pig iron and steel rails, 98 to 100 pounds per yard. Cost sheets for the past three years are being compiled at my request which will show this and also as to other products.

(VV) What, if any, dividends have been paid by Tennessee Coal, Iron & Railroad Co. since its acquisition by the corporation?

Mr. Filbert stated orally as follows:

That $124,000 (round figures) of preferred stock, 8 per cent cumulative held by outsiders, the dividends on which are paid quarterly. That no dividends are received by the United States Steel Corporation as a holding company upon this stock.

(WW) Copy of employees' stock subscription agreement, 1911, was requested and furnished with the document marked "QQ." See document marked "WW."

(ZZ) I requested to see the cablegram from J. P. Morgan in regard to the wage question, which was read April 27, 1909.

It was stated that this cablegram must be read in connection with some other cablegram which they state was sent by Mr. Gary.

A copy of this cablegram and the cablegram signed by Mr. Gary will be submitted herewith, but it will be noticed that the copy of Mr. Morgan's cablegram bears no date, and it is stated that it is merely a copy of a cipher cablegram which was delivered to J. P. Morgan & Co., and copied and then transmitted to the corporation.

In connection with the abstract of the minutes of the directors and finance committee, special attention is directed to the fact that the laws of the State of New Jersey were evidently changed prior to the issue of the ten-sixty 5 per cent gold bonds of the corporation, issued in exchange for the preferred 7 per cent stock. Special attention is also called to the reference in the minutes in regard to taxation in Pennsylvania, and the action of the corporation in regard to it.

The purpose of showing the presence of Mr. Morgan, or the various members of his firm, George W. Perkins, Charles Steele, Robert Bacon, and also J. P. Morgan, jr., at the meetings of the directors and finance and executive committees was to indicate the dominating influence of J. P. Morgan & Co. in the control and management of the corporation. As bearing upon this subject, it appears that Mr. Morgan was consulted by cable in reference to the schedule of wages in April, 1909, and it also appears by the minutes of the executive committee of July 2, 1901, that the president of the corporation stated:

He thinks that Mr. Morgan, the responsible head of the financial house that had the responsibility of bringing out this concern, should have the opportunity of being consulted as a member of the board of directors or otherwise. The chairman dislikes to have anything done that will get us into trouble, and particularly at this time.

I have previously stated that it was my intention, with the consent of the committee, to make a more exhaustive search of the minutes of the corporation as a holding company and also the minutes of the various subsidiary companies, which will probably result in producing

information of sufficient value to warrant the time spent. This opinion seems justified in view of the present inability of the corporation representatives to find the various letters and recommendations of Mr. J. A. Farrell relating to export sales and other subjects.

In reference to the cost of production of pig iron and steel rails and other products of the corporation, I stated to Mr. Filbert, the comptroller of the corporation, and to Mr. Winslow, who was always present as a representative of the corporation during my examinations, that with their elaborate organization, the completeness of their bookkeeping system, and their ability to engage the ablest talent in the land, that they probably had the finest and most complete system of factory cost accounts, which would show a comparative statement year by year of the cost of the various products of their organization in detail, to wit: Raw material, factory labor, factory overhead charges, including the maintenance, heat, light, power, etc., and I asked Mr. Winslow where these records were kept. He replied that it was some years since he had anything to do with the cost department and he did not know where I could have access to these records. When I submitted to Mr. Winslow the telegram received the other day from your committee, which said in part, "You may show this to Winslow or other representative of the corporation" (Mr. Filbert, the comptroller, being then present), a statement was made that the most complete set of such records as I have referred to above would be furnished from the office at No. 71 Broadway, in the city of New York, and I then asked them to prepare for me a statement covering the principal products of the corporation, including pig iron, steel rails, etc., for the past three years, showing the comparative factory cost.

Minutes show that the plan for the conversion of the 7 per cent accumulated preferred stock into the ten-sixty 5 per cent gold bonds was first suggested and outlined by Mr. George W. Perkins.

In conclusion, I would say that a large quantity of material has been uncovered which must be analyzed and adapted to the purposes and the time at the disposal of your committee.

Yours, very respectfully,

F. J. MacRae,
Certified Public Accountant, State of New York.

EXTRACTS FROM REPORT MADE TO THE COMMITTEE AUGUST 2, 1911.

In regard to the demand upon the subsidiary companies of the United States Steel Corporation in Pittsburgh for their books and papers, in accordance with the authority vested in me under the resolutions adopted by the committee, I have the honor to report that on July 24, 1911:

(1) I called on President Schiller, of the National Tube Co., who was also an official of the Shelby Tube Co., presented my credentials, and made the demand on him. He stated that he personally had no objection, but would have to communicate with New York, and that he would inform me of the instructions received from there over the long-distance telephone at 11.45 this morning (Aug. 2).

(2) I then called on the American Bridge Co., and the official in charge, Mr. — Thompson, informed me that the financial books of the

company were in Pittsburgh and that the minutes of the company were in New York; but that he would not allow me access to any of them without first communicating with his superior officers in New York.

(3) I then called on Mr. Wheeler, treasurer of the American Sheet & Tin Plate Co., and he stated that he would like time to get instructions from New York. I then requested him to write me at the Fort Pitt Hotel what his decision would be after hearing from New York.

(4) I then called on President Dinkey, of the Carnegie Steel Co., presented my credentials, and made the request for books and documents, and he also stated that he would prefer to consult with New York, and I agreed to wait until he received an answer and call on him again in the afternoon for his decision.

(5) I then called on Mr. McCauseland, treasurer of the Union Steel Co., and he informed me that the financial books of the company were in Pittsburgh, but that the minutes were in the posesssion of the secretary, in New York.

* * * * * * *

In accordance with the above, I later called up Mr. Wheeler, treasurer of the American Sheet & Tin Plate Co., President Schiller, of the National Tube Co., and called on President Dinkey, of the Carnegie Steel Co., and received, in effect, the same answer from all three—which was a request that I wait until to-morrow, until after the meeting of the directors of the United States Steel Corporation could be held, when they would receive definite instructions from the counsel of the corporation, Mr. Lindabury, and that they would then give me a definite answer. I immediately telegraphed you to this effect, as follows:

Credentials presented, demand made. Officials of the various subsidiary companies request time until to-morrow to consult with counsel or receive instructions from New York. Letter follows.

* * * * * * *

Late in the afternoon of the 26th of July, I was informed by Mr. Dinkey, of the Carnegie Steel Co., that I could have access to the minutes of his corporation, and I immediately availed myself of the privilege, as also to examine the minutes of the American Sheet & Tin Plate Co., National Tube Co., and Clairton Steel Co.

In the Carnegie Steel Co. such minutes as referred to meetings prior to April 1, 1901, were taken from the binder, and in the case of the American Sheet & Tin Plate Co. the minute books prior to that date were sealed. In which instance I made request to see these minutes prior to the organization of the United States Steel Corporation for the purpose of making a logical inquiry as to the conditions existing and leading up to the formation of the corporation. In which instance Mr. Dinkey, of the Carnegie Co., and Mr. Wheeler, of the American Sheet & Tin Plate Co., requested time to consult their superior officers or counsel.

I stated to Mr. Wheeler that I found no reference in the minutes of of the American Sheet & Tin Plate Co. to the acquisition by his company of the Morgantown Iron Works Co., of Morgantown, W. Va., and asked him for any papers or documents bearing upon this matter. He said he had none except a bid for the property. I then stated to him that I found no reference in the minutes of his com-

pany to the contracts of his company with the American Can Co., which I knew existed, for the reason that they were referred to in the minutes of the United States Steel Corporation in New York, and I requested him to show me all such selling contracts of his company with the American Can Co. He replied that he could not comply with my request or demand without first consulting with counsel and the United States Steel Corporation officials. This was in the presence of Mr. Ireland, one of my assistants.

Under your direction I left Pittsburgh and came to New York, leaving two of my assistants, namely, Mr. Anthony J. Ernest and Mr. Robert Duncan Ireland, to complete the examination of the minutes.

On the 31st of July I received a letter from Mr. Ernest to the following effect:

I find that the charter of the Carnegie Steel Co. provides for an executive committee to exercise certain powers. Shall I demand minutes of same, if any?

To which I replied by telegram:

Demand all minutes that may be referred to and any other books and documents that you deem necessary for the examination.

I directed Mr. Ireland to go to the American Sheet & Tin Plate Co. and examine the minutes and get copies of the agreements between the American Sheet & Tin Plate Co. and the American Can Co. Mr. Wheeler refused to furnish agreements at this time, stating he did so on the advice of his counsel and on the further ground that they should not be given—

except under an arrangement whereby they would be used only as confidential information for the committee.

which quotation he read from a telegram he held in his hands.

NEW YORK, *December 4, 1911.*

Hon. AUGUSTUS O. STANLEY,
Chairman Special Committee on Investigation of United States Steel Corporation, Washington, D. C.

DEAR SIR: Since submitting my last written report to you under the date of August 2, 1911, I desire to report further, for the information of the committee, as follows:

At your request I attended the hearings of the committee in the municipal chamber in the New York City Hall on August 3, 4, and 5; and, under your instructions, I went to Washington on August 7 and attended the hearings there on August 8, 9, 10, 11, and 12.

On Monday, August 14, as directed by you, I called on Mr. Herbert Knox Smith, Commissioner of Corporations, to obtain from him certain accounts and other data in his office, which, under the consent given to the committee by the President, was to be placed at the disposal of the committee; and on that day I handed you a written report of my request and Mr. Smith's reply thereto, as follows:

On the 14th day of August, 1911, Mr. MacRae called on the Commissioner of Corporations, Mr. Herbert Knox Smith, accompanied by Miss Minnie Mahler, and requested Mr. Smith to furnish him (Mr. MacRae) with a copy of his (Mr. Smith's) requests upon the Steel Corporation for books, documents, or information by the end of the week.

Mr. MacRae also requested Mr. Smith to furnish him with the trading and profit-and-loss accounts of the various subsidiary companies of the United States Steel

Corporation, which he understood had been submitted to him by the United States Steel Corporation. Mr. Smith said that such information as he had in his possession respecting this matter was only fragmentary.

Mr. MacRae requested Mr. Smith to furnish him with the production cost of the principal products of the Steel Corporation. Mr. Smith said that the data furnished in this respect by the Steel Corporation had been returned to it and he only had copies in his possession, and that his figures in this regard when published would be composite costs of the steel company and other independent companies amalgamated with statistics or data compiled from the Iron Age and other trade journals. I understood him to say that it would be several months before this information would be published and available.

On August 15 to 23, inclusive, I attended at the office of the corporation in New York and directed the compilation of the accounts and the examination of the minutes of the subsidiary companies, and I was also in Washington in conference with you regarding the subjects then under investigation and the evidence sought to be procured from the Commissioner of Corporations, and I again called upon the said commissioner and handed you the following memorandum as the result of my visit:

The requests made on the United States Steel Corporation by the Bureau of Corporations comprise seven books, or about 700 pages. The requests principally relate to mill-cost sheets of the various products in minute detail, profit-and-loss statements, and "orders" and "bookings" of sales for the various companies, all of which have been returned in accordance with the agreement, and receipts signed by the commissioner or his assistants, a copy of which receipt is as follows:

Received of United States Steel Corporation schedule and statistical statements covering the operations of ——— Co. properties for the year ——, as enumerated in schedules annexed hereto.

The schedules and statistical statements above referred to are received on the understanding that they are merely loaned to me for my inspection and consideration, that I will not make literal copies thereof for the files of any department of the United States Government, and that said schedules and statements will be returned to the United States Steel Corporation as soon as I have completed inspection of same, and in any event prior to ———."

Under my direction a copy of the requests made by the Bureau of Corporations on the United States Steel Corporation was made, and is now in your possession.

From August 24 to the present time I have attended at the office of the corporation in New York (except on September 12 to 15, September 23 to 26, and November 9 to 10, when I was in Washington in consultation with you) in the preparation of the accounts and the examination of the minute books of the various companies and investigation of other matters in the interests of the committee.

Many delays of one, two, or three days at a time occurred in furnishing the minute books of the subsidiary companies for the reason, as stated by Mr. Bolling, that he or some other representative of the company has to read all books before permitting me to examine them, and had to get the consent of the former officials or directors of the subsidiary companies before permitting me to examine them. And on or about the 14th of October I expressed to Mr. Bolling my dissatisfaction with the progress I was making in the examination of the minutes of the various subsidiary companies, owing to the slowness in delivering the said minutes, and the delays between the time of finishing the reading of one set of minutes and the production of another set. I stated that I would take Mr. Ernest from the work of reading the minutes and detail him to some other duties until such time as Mr. Bolling could have sufficient sets of minutes ready for

inspection to allow the examination to be taken up and proceed with some degree of rapidity.

On October 30 I informed Mr. Bolling that I was ready to have Mr. Ernest proceed with the reading of the minutes, and on October 31 Mr. Bolling informed me, through Mr. Winslow, that owing to the press of business due to the Government against the Steel Corporation, and in the absence of Mr. MacVeagh, that he had been unable to read any of the minutes, and he requested a further delay until he could be at liberty to do so.

On November 8 I received the following letter from the United States Steel Corporation, signed by their attorney, Mr. Raynal C. Bolling:

NOVEMBER 8, 1911.

DEAR SIR: Before asking that we furnish you further data, such as minutes and other records, might it not be well for you to ascertain what are the views of Mr. Stanley with respect to the propriety of a request for this data, now that the United States Steel Corporation and its subsidiary companies, as well as a number of individuals connected with the corporation, have been made defendants in an action brought by the Government? May not Mr. Stanley feel that, with proper respect for the courts and regard for the rights of defendants therein, evidence ought not to be requested by an investigating committee from defendants during the progress of court proceedings?

Very truly, yours, RAYNAL C. BOLLING.

Mr. F. J. MACRAE,
68 William Street, New York City.

In response to a telephonic communication from you I went to Washington on November 9 to consult with you, and on November 10 the following letter was addressed by you to Mr. Raynal C. Bolling:

NOVEMBER 10, 1911.

Mr. RAYNAL C. BOLLING,
Assistant General Solicitor, United States Steel Corporation,
71 Broadway, New York City.

DEAR SIR: Your favor of November 8, addressed to Mr. F. J. MacRae, has just been brought to my attention, in which you suggest that Mr. MacRae ascertain my views in respect to the propriety of his request for certain data necessary to complete the investigation of the books of the Steel Corporation as authorized by the committee. Mr. MacRae's duties with this committee are in no way affected by the action brought by the Department of Justice.

I am of the opinion that neither the Department of Justice nor any member of this committee regard Mr. MacRae's requests as in any way evidencing a lack of respect for the courts or regard for the rights of defendants therein.

I sincerely hope that upon receipt of this communication Mr. MacRae will not be further delayed in his endeavor to complete this examination.

Yours, very truly,

A. O. STANLEY.

On November 17 Mr. Bolling informed me that he would turn over for my inspection the minutes of the Oliver Iron Mining Co., and would furnish such other minutes as have been asked for in due course of time after they had been read by some representative of the Steel Corporation.

On November 29, upon receipt of a telephonic communication from you, I went to the office of the corporation and saw Mr. Winslow, and made the same request that I have made every day for the past several weeks, to wit, that he see Mr. Filbert and get for me the explanation of certain adjustments in the making up of the annual reports of the United States Steel Corporation, which it is necessary for me to have in order to complete my figures. I also stated that I have received a request from you to furnish the data regarding the cost of

production of principal products of the corporation and also the minutes of such companies as have not already been supplied. Mr. Winslow, on behalf of the United States Steel Corporation, replied that Mr. Gary, Mr. Filbert, and Mr. Bolling were in Washington, and that Mr. Bolling had stated to him yesterday afternoon that on account of the time taken in complying with the demands of the Senate investigating committee and the work in connection with the Government suit that nothing could be done in compliance with the demands of the committee through me at that time.

Requests for data made by Mr. MacRae and disposition of the same by the corporation.

As directed by you, I made a copy of the voucher for $10,000 referred to in the examination of Mr. George W. Perkins, which was furnished to me as follows:

PHILADELPHIA, PA., *September 19, 1904.*

UNITED STATES STEEL CORPORATION.

MY DEAR SIRS: I inclose herewith the Republican national committee's receipt for your subscription to the campaign fund.

Respectfully, yours,

E. T. STOTESBURY,
Chairman.

[Inclosure.]

REPUBLICAN NATIONAL COMMITTEE,
Madison Square, New York, September 17, 1904.

Received from United States Steel $10,000.

C. H. DUEL,
Assistant Treasurer.

(Press of 40 Nassau Street.)

NOTE.—E. T. Stotesbury is a member of the firm of J. P. Morgan & Co.

2. I was furnished with document marked "Exhibit U," which is a statement of the companies whose stocks are owned by the United States Steel Corporation, together with the capital stock of those companies and their capital indebtedness.

3. I was furnished with Exhibit T, which is a list of plants and properties acquired by the United States Steel Corporation or its subsidiary companies on its incorporation or by purchase since, which have been sold, dismantled, or otherwise disposed of.

4. I have requested a statement of the cost of production of the principal products of the company, which has been promised but has not yet been furnished.

5. I have requested the annual reports of the subsidiary companies. These annual reports would show the assets and liabilities and the profit and loss accounts. The corporation furnished me the balance sheets showing the assets and liabilities of the various companies as of December 31, 1910, but they demurred to furnishing the trading and profit and loss statements of these companies for nine years and nine months, in accordance with my request set forth in my report to the committee July 18, 1911, unless I signed a receipt similar to that signed by Mr. Smith, which is referred to above.

There was considerable delay and discussion with the officials and attorneys of the United States Steel Corporation, which I duly reported to you in person and by letter and telegraph, and thereafter, on August 25, 1911, you instructed me by telegraph as follows:

Am surprised and exceedingly regret that any restrictions are placed upon profit and loss sheets of subsidiary companies; suggest you examine these papers under terms and conditions named in Mr. Bolling's letter of the 24th instant, with distinct understanding that committee is not in any manner whatsoever precluded, even by inference

from issuing such process as its chairman may deem proper for the production of these papers when the committee resumes its sittings.

A. O. STANLEY.

On August 28 Mr. Bolling agreed to give me the trading and profit and loss statements upon condition that I sign the receipt copied below, which, in accordance with the directions in your telegram above, I signed, as follows:

Received of United States Steel Corporation profits and loss statements of the subsidiary companies of the United States Steel Corporation for the year 19—, as follows:
* * *

These statements are received upon the condition that they are merely submitted to me for inspection, and I will not make literal copies thereof for any purpose whatever, and I will not, either in my report or in any other manner, make public the record given in said statement with respect to the gross or net profits or other details of any particular company; but it is also understood that their acceptance upon these conditions is not to be deemed in any way a waiver of any right to obtain them by subpœna which the committee may have.

From that date until the present date I have been using my best endeavors to compile these figures for the information of the committee.

I have two assistants working on these accounts and I expect that these figures will be completed within the next 30 days, if I am furnished by the corporation with the explanation of the adjustments made by the corporation in preparing their annual reports.

6. I have been furnished with the minutes of the following companies, which have been read, and extracts have been made for the use of the committee:

United States Steel Corporation, minutes of directors, finance committee, executive committee, general managers of sales, auditors supplemental extracts from finance committee minutes.

Carnegie Steel Co. (of New Jersey).
Carnegie Steel Co. (of Pennsylvania).
The Carnegie Co.
Index Carnegie Steel Co.'s minutes.
Clairton Steel Co.
Union Steel Co.
Federal Steel Co. (directors' minutes).
American Bridge Co. of New Jersey.
American Bridge Co. of New York.
Empire Bridge Co.
Trenton Iron Co.
Tennessee Coal, Iron & Railroad Co.
Universal Portland Cement Co.
Universal Portland Cement Co. (directors' minutes).
American Steel & Wire Co. of New Jersey.
H. C. Frick Coke Co.
United States Steel Products (export) Co.
Illinois Steel Co. (directors' minutes).
American Sheet Steel Co.
National Tube Co.
Shelby Steel Tube Co.

7. I have requested the production of the following minutes, which have not been furnished:

United States Steel Corporation, subsidiary companies' presidents' meetings, minutes or records of meetings (it was stated that none is kept); purchasing agents.

Carnegie Steel Co. (of Pennsylvania) before 1901.
Illinois Steel Co., executive and finance committees.
Universal Portland Cement Co., executive and finance committees.
National Steel Co.
Lake Superior Consolidated Iron Mining Co.
Duluth, Missabe & Northern Railway.
Duluth & Iron Range Railway.
Pittsburg Steamship Co.
American Steel Hoop Co.

I have also requested that the United States Steel Corporation furnish the minutes of executive and finance committees of subsidiary companies, where such committees existed and where the minutes have not already been furnished as shown above; and such minutes have not been furnished to me.

Also, Mr. Anthony J. Ernest, of the New York bar, employed by me and under my direction, is preparing a summary or brief of the evidence extracted from these minute books by him and from the testimony already taken, which I believe will be of value to the committee and which I expect will be completed in 30 days.

The letter from J. A. Farrell to Mr. Corey, dated July 27, 1903, and the letter from Mr. Farrell referred to in the minutes of finance meeting April 11, 1905, and the schedule of profits of the principal products of the organization at present prices submitted at meeting of finance committee April 27, 1909, have not been received by me.

A great loss of time has been caused by repeated delays on the part of the corporation in furnishing minutes and other matter requested. At the office of the corporation in New York the explanation was made that counsel had to read all the minutes before I could be permitted to see them; that former officials or persons who had been interested in certain subsidiary companies had to be consulted before the minutes of that company could be furnished; that other officials, who were then absent on vacation, had to be consulted before furnishing certain minutes or data; that on account of the press of other business counsel had been unable to read the minute books preparatory to furnishing same; that absence from the office and from the city of officials who were supposed to have information desired had rendered it impossible to furnish the matter required until after a short delay; the commencement of the Government suit has been referred to as a cause for delay; the Senate investigation has also been referred to; in the offices of the subsidiary companies in Pittsburgh several delays of two or three days occurred in complying with requests for reason, as stated, of the necessity of obtaining the consent of counsel in New York to the furnishing of data asked for.

Although some of the delays may have been entirely excusable, as, for instance, the delay of three days while part of the office of the corporation was being rearranged and repainted, on the other hand, the recurrence and frequency of these postponements prevented proper expedition in the prosecution of the work in its entirety, and in the short intervals when records and documents were available it increased the difficulty of the work and the need for speed in doing it. The fact that many of the documents and books were supplied in fragments—no part being furnished until the part furnished had been examined and abstracted—has also increased the difficulty of the work and consumed time.

My attention having been called to criticisms in certain quarters regarding the expense of this investigation, I believe it is due the committee and myself to make the following explanations in regard to the work being done by me.

The time spent by a large force with the admitted assistants of the United States Steel Corporation and the expenditure of a large amount of money by them is illustrated by the report of Mr. Herbert Knox Smith, and I believe that the committee will fully appreciate the labor involved in the investigation of the affairs of a corporation of such magnitude as the steel company. It should be borne in mind that at no time in the prosecution of the work have there been less than three men, and generally four men, engaged in doing it under my direction, besides typewriters and copyists, and these necessarily had to be of more than average skill and experience. In view of the extent and complexity of the detail involved in examining the financial affairs of the corporation and its many subsidiaries, this seems to be the minimum force that could make an intelligent and comprehensive investigation.

If an appropriation of $25,000 had been devoted to the accounting work alone in the investigation of the corporation it would not have been too large or disproportionate an amount in comparison with the fees ordinarily paid to professional public accountants for auditing or investigating the books of corporations in general or this corporation in particular. This is especially true in the case of this corporation because of its great size and the number of its subsidiary concerns, and also because the cost of ordinary accounting would be calculated in consideration of the expectation that the corporation itself would assist and facilitate the compilation of the account, which was done for the commissioner of corporations, and which was not done as to the figures compiled by me for the particular purposes of this committee. This was explained by me in substance to the committee at the outset of the work and before my engagement as accountant.

F. J. MACRAE,
Certified Public Accountant.

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* *Pittsburgh Steamship Co.—Profit and loss statement for 1910.*

Gross earnings from operations:		
Ore freights	$9,862,138.39	
Coal freights	506,400.50	
Sundry freights	1,672.50	
		$10,370,211.39
Operating expenses		6,710,898.16
Balance		3,659,313.23
Miscellaneous gains and losses		431,111.18
Other income		77,688.37
Total income		4,168,112.78
Interest charges	648,899.86	
Depreciation and extinguishment funds, bond-sinking funds, extraordinary replacements, etc	993,729.99	
		1,642,629.85
Net earnings, as stated		2,525,482.93
Capital stock		7,880,000.00
Bonded mortgages and other capital debt		12,704,000.00

Pittsburgh & Conneaut Dock Co.—Profit and loss statement for 1910.

Gross earnings from operations:		
Unloading ore from vessels	$1,344,455.25	
Loading ore on cars	276,518.14	
Loading cars on vessels	25,912.42	
Loading steel rails, etc., on vessels	15,620.04	
		$1,662,505.85
Operating expenses		722,136.51
Balance		940,369.34
Miscellaneous gains and losses		91,699.82
Other income		9,603.28
Total income		1,041,672.44
Less extinguishment funds, extraordinary replacements, etc		100,000.00
Net earnings as reported		941,672.44
Capital stock		100,000.00

DOCUMENT NO. 2A.

TRIAL—BALANCE AS OF DEC. 31, 1903.

Debits.

The Carnegie Co., collateral trust bonds	$159,917,000.00
Cost of capital stock of the Carnegie Steel Co., of New Jersey (629,988 shares)	504,103,492.45
Cost of capital stock of the Carnegie Steel Co., of New Jersey, owned (12 shares)	1,200.00
Cost of common stock, Federal Steel Co. (464,838 shares)	61,137,617.78
Cost of common stock, Federal Steel Co., owned (5 shares)	500.00
Cost of preferred stock, Federal Steel Co., (532,609 shares)	66,192,071.70
Cost of National Tube Co. (399,991 shares)	63,018,916.81
Cost of National Tube Co., owned (9 shares)	1,100.00
Cost of preferred stock, National Tube Co. (400,000 shares)	56,483,545.77
Cost of common stock, American Steel & Wire Co., of New Jersey (499,008 shares)	60,438,031.88
Cost of common stock, American Steel & Wire Co., of New Jersey, owned (886 shares)	88,600.00
Cost of preferred stock, American Steel & Wire Co., of New Jersey (399,885 shares)	53,093,421.29
Cost of preferred stock, American Steel & Wire Co., of New Jersey, owned (5 shares)	500.00
Cost of common stock, American Tin Plate Co. (279,990 shares)	47,665,565.11
Cost of common stock, American Tin Plate Co., owned (10 shares)	1,000.00
Cost of preferred stock, American Tin Plate Co (183,250 shares)	25,875,367.52
Cost of common stock, American Sheet Steel Co. (244,971 chares)	28,938,080.06
Cost of common stock, American Sheet Steel Co., owned (25 shares)	2,500.00
Cost of preferred stock, American Sheet Steel Co. (244,977 shares)	27,673,699.14
Cost of preferred stock, American Sheet Steel Co., owned (19 shares)	1,900.00
Cost of common stock, American Bridge Co. (309,503 shares)	32,514,714.06
Cost of common stock, American Bridge Co., owned (5 shares)	500.00
Cost of preferred stock, American Bridge Co. (313,738 shares)	34,528,528.74
Cost of Lake Superior Consolidated Iron Mines Co. (294,338 shares)	79,498,493.71
Cost of capital stock, Lake Superior Consolidated Iron Mines Co	700.00
Cost of Oliver Iron Mines Co., owned (2,000 shares) Cost of capital stock, Pittsburgh Steamship Co., owned (2,217 shares)	18,514,312.02
Cost of common stock, Shelby Steel Co., owned (114 shares)	10,000.00
Cost of common stock, Shelby Steel Co. (81,351 shares)	2,025,317.84
Cost of preferred stock, Shelby Steel Co. (49,998 shares)	1,902,938.32
	1,323,631,614.20

Organization expenses:	
NOTE.—This account is debited with items, aggregating $1,041,395.24, which, by journal entries, are transferred to the costs of the various securities acquired.	
Investments for insurance fund	$1,231,469.42
Investment for account employees bonus fund	548,625.00
Investments in securities of outside companies	1,191,143.23
Cost of United States Steel Corporation preferred stock, owned	1,051,270.00
Investments for account of sinking fund	1,197,674.81
United States Trust Co., of New York, trustee	5,604,955.05
Investments for United States Steel Corporation, 50-year 5 per cent gold bond, sinking fund	1,500,151.25
Federal Steel Co., dividend account	17,068,418.50
National Tube Co., dividend account	1,500,000.00
American Tin Plate Co., dividend account	1,160,687.50
American Sheet Steel Co., dividend account	1,408,727.00
Lake Superior Consolidated Iron Mines Co., dividend account	183,449.50
Oliver Iron Mining Co., dividend account	600,000.00
Pittsburgh Steamship Co., dividend account	221,700.00
The Carnegie Co., dividend account	15,510,000.00
The Carnegie Co., of New Jersey, loan account	520,000.00
Union Steel Co., general account	594,953.24
Union Steel Co., interest on sinking fund	1.00
Oliver Iron Mining Co., general account	1,016,341.26
Union R. R. Co., general account	83,400.38
Lake Superior Consolidated Iron Mines Co., loan account	4,500,000.00
Pittsburgh Steamship Co., loan account	8,500,000.00
J. P. Morgan & Co., bond interest account	1,411,718.68
The Carnegie Co., bond interest account	1,999,945.85
Carnegie Steel Co., interest account	1,733.33
Bessemer & Lake Erie R. R. Co., general account	188,000.00
United States Steel Corporation, clearance account	715,463.65
Interest accrued on investments for account of sinking fund	12,775.00
Employees preferred stock subscriptions	645,425.27
Interest accrued on investments 50-year bond sinking fund	30,383.34
Accrued interest on investments in securities of outside companies	18,737.50
J. P. Morgan & Co., interest account	2,744.96
Cash	8,776,491.53
Sundry companies and individuals	14,621.54
J. P. Morgan & Co.	12,822,900.00
Premiums paid on United States Steel Corporation 50-year, 5 per cent gold bonds, purchased for sinking fund	738,343.61
United States Steel, 1060'5 per cent sinking fund bonds in treasury	30,000,000.00
Total debit	1,446,201,865.60

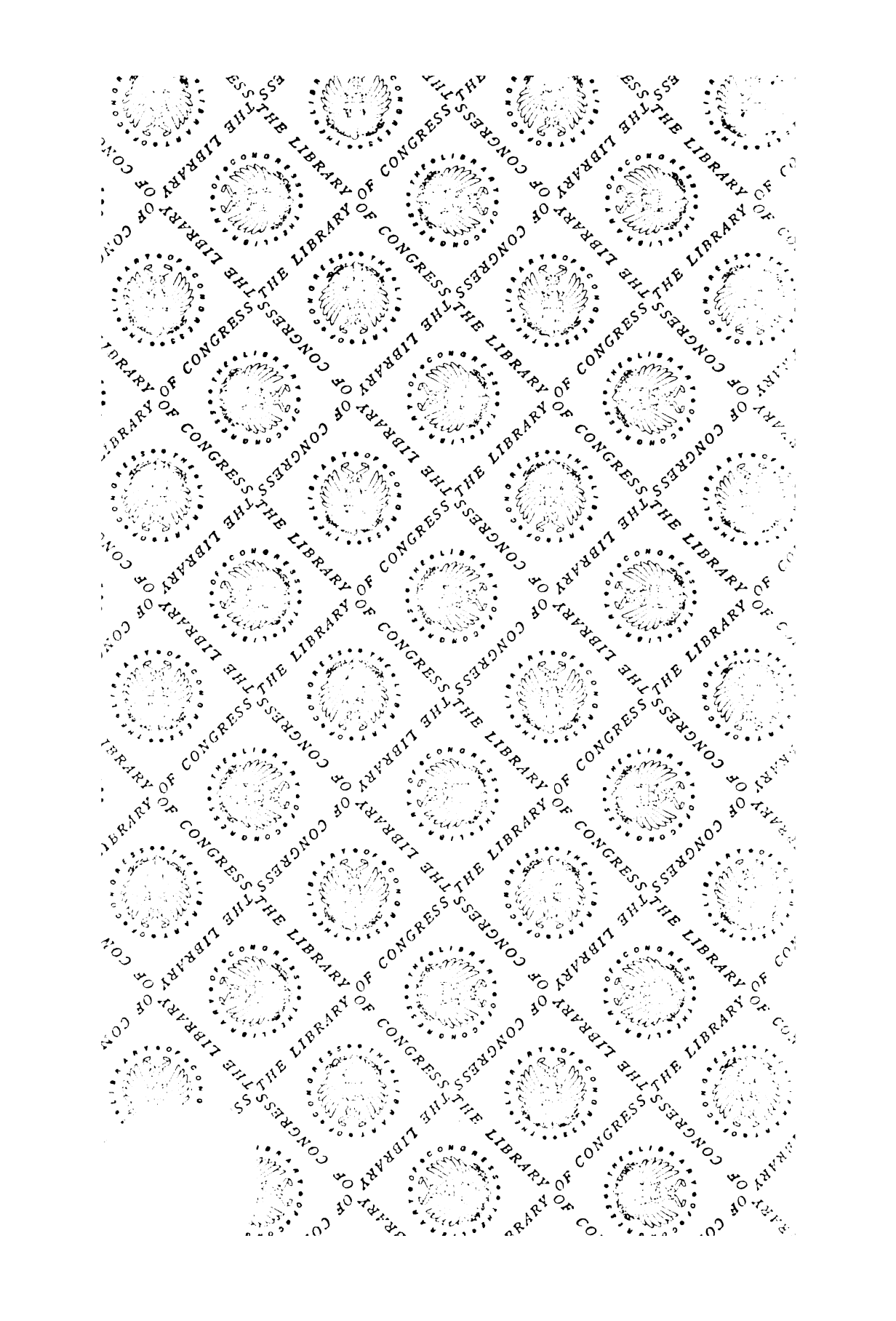
Credits.

Carnegie Steel Co., general account, credit balance		$38,750.00
Federal Steel Co., general account		3,428,881.50
National Tube Co.		85,889.25
American Steel & Wire Co., of New Jersey		2,471,135.42
American Tin Plate Co., general account		8,784.00
American Sheet Steel Co., general account		4,860.27
Federal Steel Co., interest account		1.94
Subsidiary companies insurance fund		1,900,293.00
Common stock		508,302,500.00
Preferred stock		360,281,100.00
United States Steel Corporation, 50-year 5 per cent gold bonds:		
Series A	$53,910,000.00	
Series B	49,565,000.00	
Series C	48,985,000.00	
Series D	48,337,000.00	
Series E	49,944,000.00	
Series F	47,578,000.00	
		298,319,000.00

United States Steel Corporation, 1060′ 50-year, 5 per cent sinking fund gold bonds		$152,902,500.00
J. P. Morgan & Co., compensation account, balance due:		
Compensation for the conversion of preferred stock into 5 per cent bonds	$6,116,112.00	
Less paid on account	6,016,440.00	
Balance due as above		99,672.00
Further sum reserved until completion of transactions, $683,388, making compensation, as charged, $6,800,000.		
Audited vouchers		122,428.25
Accrued interest on bonds		4,473,754.16
Accrued interest on Steel Corporation 1060′ sinking fund gold bonds		1,274,187.50
Matured unpresented coupons		51,551.99
Accrued bonus fund		634,642.37
Accrued special bonus fund, 1903, on employees' preferred stock subscriptions		237,185.00
Dividends on preferred stock, unpaid		6,304,919.25
Accrued interest due J. P. Morgan & Co		53,431.25
Guarantee fund for indebtedness due from American Bridge Co		750,000.00
Accrued sinking fund on United States Steel, 50-year 5 per cent gold bonds		1,773,333.33
Sinking fund paid on United States Steel Corporation 5 per cent gold bonds		6,080,000.00
Accrued sinking fund on United States Steel, 1060′ 50-year 5 per cent gold bonds		757,500.00
United States Steel Corporation, 50-year 5 per cent gold bonds in sinking fund:		
Series A	$75,000.00	
Series B	421,000.00	
Series C	1,000,000.00	
Series D	1,649,000.00	
Series E	44,000.00	
Series F	2,409,000.00	
		5,598,000.00
Accretions to United States Steel, 50-year 5 per cent sinking fund gold bonds		263,298.66
United States Steel Corporation 1060′ 5 per cent sinking fund bonds issued and sold but undelivered		17,097,500.00
United States Steel 1060′ 50-year 5 per cent sinking fund gold bonds issued but unsold		30,000,000.00
Profit and loss account		42,202,878.46
Reserve for compensation payable in connection with conversion of preferred stock into bonds		683,888.00
Total credits		1,446,201,865.60

Pittsburgh & Conneaut Dock Co. profit and loss statement for 1910.

Gross earnings from operations:		
Unloading ore from vessels	$1,344,455.25	
Loading ore on cars	276,518.14	
Loading cars on vessels	25,912.42	
Loading steel rails, etc., on vessels	15,620.04	
		$1,662,505.85
Operating expenses		722,136.51
Balance		940,369.34
Miscellaneous gains and losses		91,699.82
Other income		9,603.28
Total income		1,041,672.44
Less extinguishment funds, extraordinary replacements, etc		100,000.00
Net earnings as reported		941,672.44
Capital stock		100,000.00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